# ACOPOS
# Intelligent servo drives

Increased production volume, reduced production cycles, and improved quality with greater precision become a reality with ACOPOS servo drives.

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# System characteristics

## High-performance servo drive concept

The ACOPOS servo drive family is an important component of the complete automation solutions provided by B&R. Industry-specific functions and intuitive tools form the basis for short development times.

An important criteria for the performance of an automation solution is a fast and precise reaction to events dependent on the application or sudden changes in the production process. Therefore, ACOPOS servo drives work with very short scan times and communication cycles of 400 $\mu$s, which only amount to 50 $\mu$s in the control loop.

## More room for innovation

The successful application of ACOPOS servo drives in the following industries demonstrates the impressive innovative power of their pioneering design: performance and function coupled with user-friendliness.

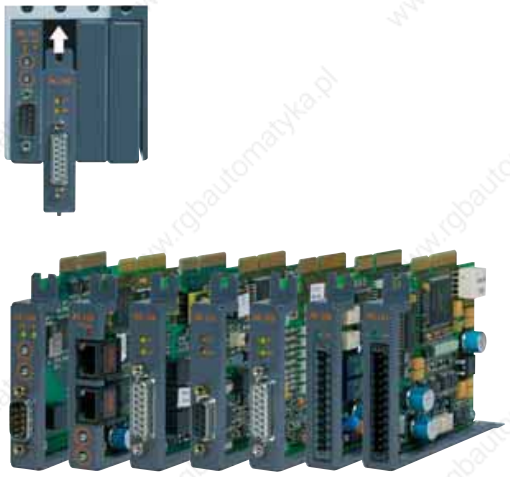
- Packaging industry
- Handling technology
- Plastics processing
- Paper and printing
- Textile industry
- Wood industry
- Metal working industry
- Semiconductor industry


## Outstanding quality, robust and secure

The ACOPOS servo family was tested thoroughly during the development phase. Under difficult conditions, such as heavy vibrations or increased temperatures, the devices were subject to loads that greatly exceed the values that occur in normal everyday operation.

EMC was given special attention to facilitate use in a rough industrial environment. Field tests have been carried out under difficult conditions in addition to the tests defined in the standard. The results confirm the excellent values measured by the testing laboratory and during operation. The necessary filters, which meet CE guidelines, are also integrated in the device. Using computer-aided models, the thermal behavior of the entire system is pre-calculated based on measured currents and temperatures. This results in maximum performance by taking advantage of the system's full capabilities. ACOPOS servo drives use the information on the motor's embedded parameter chip, which contains all relevant mechanical and electronic data. The work-intensive and error-prone task of manually setting parameters is no longer necessary and start-up times are substantially reduced. During service, relevant data can be requested and the cause of problems that may exist can be determined.

The ACOPOS servo family is also available with partially-coated circuit boards. These versions are - with identical specifications - more robust in regard to environmental influences such as dust, aggressive vapors or moisture.

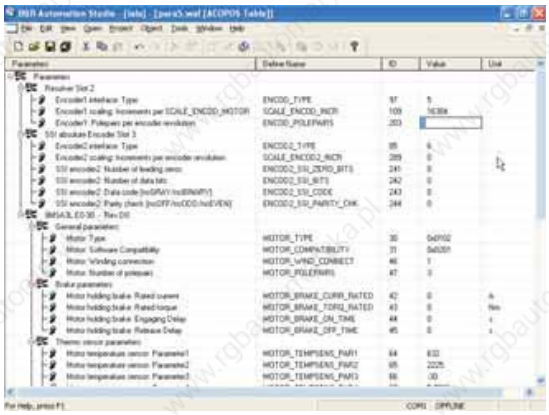


ACOPOS plug-in modules

## Modular and precise with communication options

The I/O points needed to operate a servo axis are part of the standard equipment for ACOPOS servo drives. The user is provided two trigger inputs for tasks requiring precise measurements or print mark control.

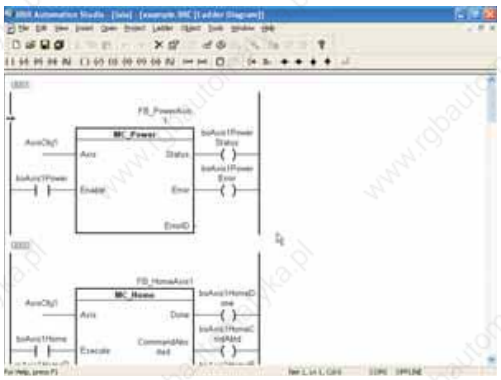
Further configuration of the ACOPOS servo drive to meet the respective application-specific demands takes place using plug-in modules. Plug-in modules are available to make network connections with other drives, controllers and visualization devices as well as for the connection of encoders, sensors and actuators. Additionally, CPU modules for controller and drive integration are also available for drive-based automation.

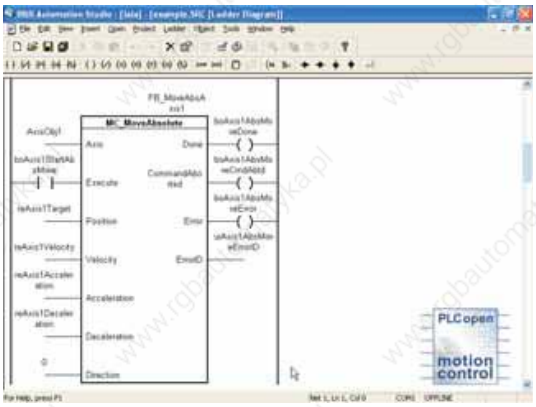


## Configuring instead of programming

ACOPOS servo drives can be configured for demanding positioning tasks such as electronic gears or cam profiles. Based on long-term cooperation with customers from all over the world, B&R shares its know-how in the form of compact function blocks for many applications. Industry-specific functionality can be quickly and easily implemented in an application program.

# System characteristics






## PLCopen motion control function blocks

Motion control is one of the central themes in automation technology. This is partly due to its high portion of the entire automation expenses and the resulting savings potential.

The PLCopen motion control function blocks (conforming to IEC 61131-3) support the user when implementing these possibilities by providing vendor-independence and reducing development times. The user can choose between the programming languages Ladder Diagram (LD), Structured Text (ST) and the high-level language "C".

The function range of the function blocks is divided into the areas of single and multi-axis movements. In addition to the usual relative and absolute movements, the first of the two areas also includes the possibility of overlapping movements. In the area of multi-axis movements, functions such as gears, cam profile functions, up/down synchronization and differential gear (changing phase angles) are supported.

## Higher productivity with smart process technology

Smart process technology meets the customer's need for cost-effective solutions and high production speeds. This freely configurable technology library is seamlessly integrated into the existing motion control product.

Using indirect process parameters makes it possible to eliminate sensors, which are often not fast enough to keep up with high production speeds. Synchronous processing and short response times make it possible to achieve excellent productivity and precision. For example, highly efficient and intelligent decentralized units allow seamless quality control. In the field, this significantly reduces cycle times while improving component quality.

This meets the requirements of modern motion control products such as high product quality, machine productivity along with short maintenance and down times and, to a greater extent, seamless quality control during production.

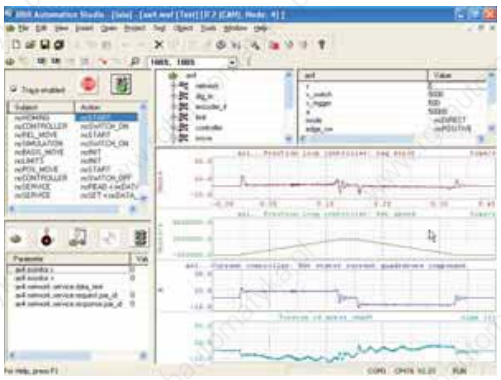
## ACOPOS also perfectly suited for CNC applications

The integrated "Soft" CNC system from B&R unites all of the software components necessary for machine automation on a 64-bit processor platform. It provides sufficient computing power for complex processing machines. The integrated system architecture, together with ACOPOS servo drives, provides many opportunities regarding reaction speed, data throughput and precision, and also allows cost savings to be made.

- Uniformly integrated ACOPOS servo drive technology
- Powerful and fast-reacting
- Unlimited flexibility of PLC and CNC systems provides room for automation ideas
- 8 independent CNC channels
- Up to a total of 100 axes for positioning, CNC, electronic gears
- Individual graphic interface
- Nearly unlimited system memory for programs, diagnostics and process data
- Internet or intranet connection for inspection or remote maintenance

Leading manufacturers of water jet, laser and torch cutting production technologies are already utilizing these technological advantages.

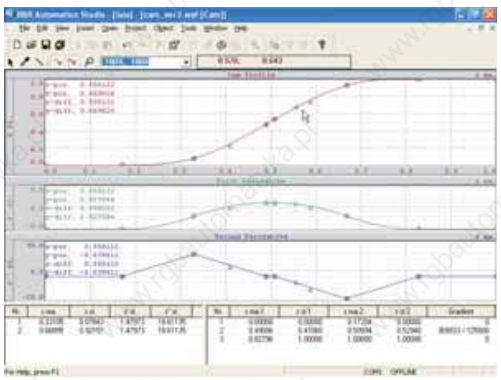
# System characteristics



## Quick and easy commissioning

All B&R products are programmed in a uniform manner using B&R Automation Studio with the Windows look and feel. Complex drive solutions can be created after a short orientation period. Adding hardware components and program sections, as well as their configuration, is done in dialog boxes; this reduces project development times considerably.

Axis movements can be checked without programming using NC Test. All types of movements, ranging from point-to-point to gear functions, can be carried out interactively. The reaction of the axis can be seen online in the monitor window. The trace function records relevant drive data for clear evaluation.



## Tools for straightforward and efficient diagnostics

The drive is monitored in real-time using the oscilloscope function. Many trigger possibilities generate informative data for analyzing the movement during operation. The graphic display allows the user to make fine adjustments and optimizations of the movement in the microsecond range. The integration of powerful tools, such as the cam editor, reduces programming for complex coupled movements to simple drag-and-drop procedures. The results and effects on speed, acceleration and jolt can be immediately analyzed graphically.

## ACOPOS servo drives

Controlling your power transmission system with ACOPOS™ servo drives from B&R allows you to fully use the advantages of an optimized system architecture. Applications that require additional positioning tasks such as torque limitation or torque control can be created quickly and elegantly. The flexible system concept for B&R servo drives is achieved using matched hardware and software components. You can select the optimal system configuration for your application and increase your competitiveness.

- Perfect integration in all B&R product families
- Object-oriented axis programming minimizes development time and increases reusability
- Integrated technology functions for industry-specific tasks
- Operation of synchronous and induction motors possible
- Current controller scan time up to 50µs
- Reduced commissioning and service times using "embedded motor parameter chip"
- CAN bus and POWERLINK network connection
- Input voltage range from 400 - 480 VAC (±10 %) for many areas of use
- Connection possibilities for all standard encoder systems
- Up to two free slots for optional technology modules
- Electronic secure restart inhibit integrated
- Optionally available as version with partially-coated circuit boards - more robust in regard to environmental influences

## Overview

The ACOPOS servo drive series covers a current range from 1.0 to 128 A and a power range from 0.5 to 64 kW with 11 devices in 4 groups. They offer connection possibilities for all standard encoder systems and modular fieldbus interfaces. ACOPOS servo drives are suitable for both synchronous and induction servo motors and have built-in line filters to meet the limit values for CISPR11, Group 2, Class A.

| | 8V1010.50-2, 8V1010.501-2<br>8V1016.50-2, 8V1016.501-2<br>8V1010.00-2, 8V1010.001-2<br>8V1016.00-2, 8V1016.001-2 | 8V1022.00-2, 8V1022.001-2<br>8V1045.00-2, 8V1045.001-2<br>8V1090.00-2, 8V1090.001-2 | 8V1180.00-2, 8V1180.001-2<br>8V1320.00-2, 8V1320.001-2 | 8V1640.00-2, 8V1640.001-2<br>8V128M.00-2, 8V128M.001-2 |
|---|---|---|---|---|
| Power connections | Plug connection | Plug connection | Plug connection | Fixed |
| Integrated line filter | Yes | Yes | Yes | Yes |
| Mains failure monitoring | Yes | Yes | Yes | Yes |
| DC bus connection | Yes | Yes | Yes | Yes |
| 24 VDC supply | External [1] | External [1] | External or internal via DC bus | External or internal via DC bus |
| 24 VDC output | No | No | 24 V / 0.5 A | 24 V / 0.5 A |
| Integrated brake chopper | Yes | Yes | Yes | Yes |
| Internal braking resistor | Yes | Yes | Yes | Yes[2] |
| Connection of External Braking Resistor Possible | No | No | Yes | Yes |
| Monitored output for motor holding brake | Yes | Yes | Yes | Yes |
| Monitored input for motor temperature sensor | Yes | Yes | Yes | Yes |
| Max. number of plug-in modules | 3 | 4 | 4 | 4 |

1) External DC bus power supply 0PS320.1 (24V / 20A) can be used.

2) The braking resistor integrated in the ACOPOS servo drives 1640 and 128M is dimensioned so that it is possible to brake to a stop (in a typical drive situation).

## 24 VDC supply during power failures

In order to be able to provide the stop function for category 1 according to IEC 60204-1 during a power failure, the 24 VDC supply voltage for the servo drives as well as encoders, sensors and the safety circuit must remain active during the entire stopping procedure. The ACOPOS servo drives recognize a power failure and can immediately initiate active braking of the motor. The brake energy that occurs when braking is returned to the DC bus and the DC bus power supply can use it to create the 24 VDC supply voltage. An external DC bus power supply must be used for ACOPOS servo drives 8V1010 to 8V1090. A DC bus power supply is integrated in ACOPOS servo drives 8V1180 to 8V128M. The ACOPOS servo drives with an integrated DC bus power supply provide the 24 VDC supply for the servo drive and also a 24 VDC output to supply encoders, sensors and the safety circuit. In may cases, it is not necessary to use an uninterruptible power supply (UPS) which is otherwise needed.

# Typical topologies

## ACOPOS configurations

ACOPOS servo drives include multiple technology-specific functions with performance, flexibility and capability in the field which has been remarkably proven in countless applications. The ACOPOS functions listed below are basic functions which the user can switch between as needed within 400 µs. Furthermore, manipulations such as changes in product length, print mark control, overlying torque control, brief process adaptations and quality checks can be carried out at any time.

- Point-to-point
- Electronic gears
- Electronic compensation gears
- Cross cutters
- Electronic cam profiles
- Flying saws
- Line shaft
- CNC

ACOPOS servo drives can be used in various configurations depending on the network type and the requirements of the application. The functions listed above are available to the user in each of the topology examples shown.

Reaction speeds are not influenced by the network and control system being used if technology functions are processed directly on the ACOPOS servo drive. Additional sensors and actuators must be integrated in the control and adaptation for more complex processes. In these cases, the level of performance depends mostly on the type of network and control system being used.
The topology examples shown on the following pages provide an overview of the bandwidths which are possible with B&R automation components.

## ACOPOS in the POWERLINK network

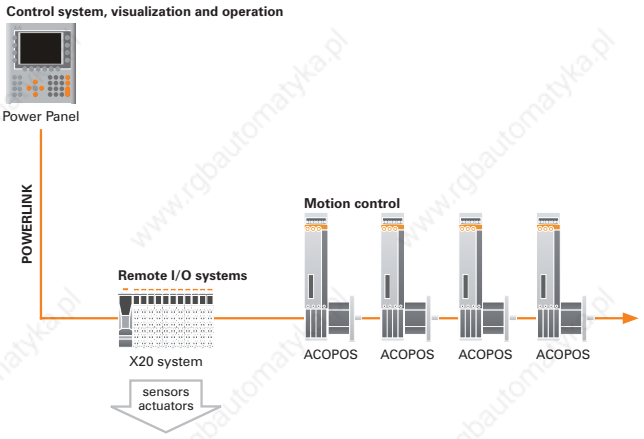
High-performance machine architectures require flexible networks and fieldbuses. With POWERLINK, a network is available to the user that fully meets the high demands of dynamic motion systems. POWERLINK adapts to the requirements of the machine and the system. The rigid coupling of many axes with controllers, industrial PCs, I/O systems and operator panels allows machines and systems to be created with the highest level of precision. Compatibility to standard Ethernet also reduces the number of networks and fieldbuses on the machine level.

## Successful areas of use for these topologies:

- Packaging industry
- Handling technology
- Plastics processing
- Paper and printing
- Textile industry
- Wood industry
- Metal working industry
- Semiconductor industry

## Compact, modular motion control applications

- Modular machine architecture, up to 100 m distance between the individual axes
- Minimal wiring required due to line structure (no ring)
- No additional infrastructure components needed
- Drive control loop synchronized to the PLC program

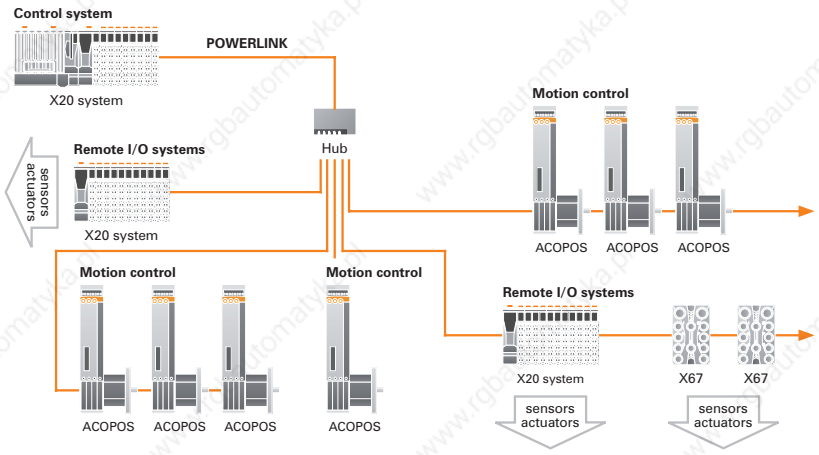



| Components and technologies | | |
|---|---|---|
| Control system | Power Panel: Integrated control, operation, and visualization | 787 |
| Visualization and operation | Power Panel: Integrated control, operation, and visualization | 787 |
| Motion control | ACOPOS: Intelligent servo drives | 1251 |
| | Synchronous motors: Dynamic precision drives | 1459/1585/1645 |
| Remote I/O systems | X20 System: Slice-based I/O and control system | 37 |
| Network and fieldbuses | POWERLINK | 611 |

# Typical topologies

**Extensive, modular motion control applications with up to 253 axes**

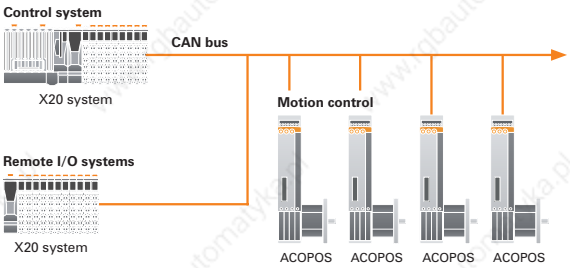
- Modular machine architecture, up to 100 m distance between the individual axes
- Optimized wiring, due to mixed star-line structure
- Nodes with fast and slow scan rates can be operated within one network. This eliminates the need to divide the network into fast and slow segments.
- Drive control loop synchronized to the PLC program




| Components and technologies | | | |
|---|---|---|---|
| Control system | X20 System: Slice-based I/O and control system | | 37 |
| Motion control | ACOPOS: Intelligent servo drives | | 1251 |
| | Synchronous motors: Dynamic precision drives | | 1459/1585/1645 |
| Remote I/O systems | X20 System: Slice-based I/O and control system | | 37 |
| | X67 System: Remote I/O with IP67 protection | | 419 |
| Network and fieldbuses | Inside the machine | POWERLINK | 611 |
| | Host/line communication | Ethernet TCP/IP | |

## ACOPOS in a CAN bus network

The dynamic requirements for small and mid-sized machines with several axes can be handled efficiently using a CAN bus. The CAN bus is a cost-effective fieldbus for networking ACOPOS servo drives with controllers, industrial PCs, I/O systems and operator panels.

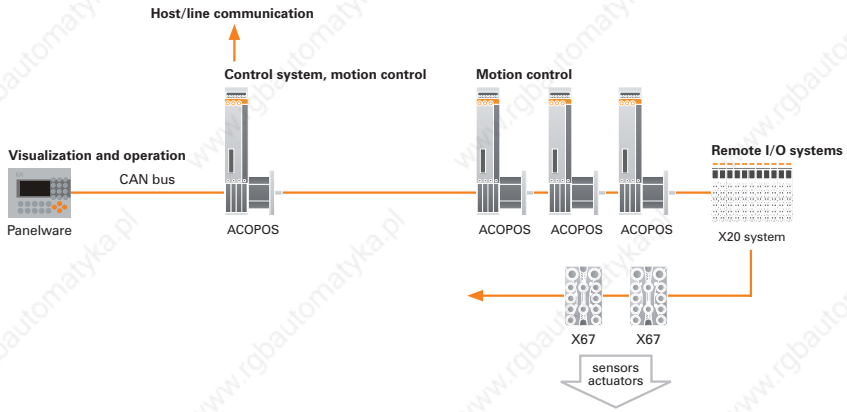



| Components and technologies | | |
|---|---|---|
| Control system | X20 System: Slice-based I/O and control system | 37 |
| Motion control | ACOPOS: Intelligent servo drives | 1251 |
| | Synchronous motors: Dynamic precision drives | 1459/1585/1645 |
| Remote I/O systems | X20 System: Slice-based I/O and control system | 37 |
| Network and fieldbuses | CAN bus | 611 |

# Typical topologies

## Drive-based control

The controller is located centrally on an ACOPOS servo drive. The drives are networked and synchronized with each other via the CAN bus. As a result, electronic gear and cam profile applications as well as CNC applications are possible in addition to simple point-to-point movements. Control of the simple operation/visualization is handled by the controller on the ACOPOS servo drive. I/O signals are connected in the switching cabinet or directly in the machine room. By eliminating the need for an external controller, even very limited space can be used optimally.




| Components and technologies | | | |
|---|---|---|---|
| Control system | ACOPOS: Intelligent servo drives | | 1251 |
| Visualization and operation | Panelware: Compact operator panels | | 773 |
| Motion control | ACOPOS: Intelligent servo drives | | 1251 |
| | Synchronous motors: Dynamic precision drives | | 1459/1585/1645 |
| Remote I/O systems | X20 System: Slice-based I/O and control system | | 37 |
| | X67 System: Remote I/O with IP67 protection | | 419 |
| Network and fieldbuses | Inside the machine | CAN bus | 611 |
| | Host/line communication | Ethernet TCP/IP | |

# Product overview

## ACOPOS servo drives

| Model number | Short description | |
|---|---|---|
| 8V1010.50-2 | Servo drive 3x 110-230V / 1x110-230V, 2.0A, 0.45kW, line filter, braking resistor and electronic secure restart inhibit integrated | 1270 |
| 8V1010.501-2 | Servo drive 3x 110-230V / 1x110-230V, 2.0A, 0.45kW, line filter, braking resistor and electronic secure restart inhibit integrated, coated | 1270 |
| 8V1016.50-2 | Servo drive 3x 110-230V / 1x110-230V, 3.2A, 0.7kW, line filter, braking resistor and electronic secure restart inhibit integrated | 1270 |
| 8V1016.501-2 | Servo drive 3x 110-230V / 1x110-230V, 3.2A, 0.7kW, line filter, braking resistor and electronic secure restart inhibit integrated, coated | 1270 |
| 8V1010.00-2 | Servo drive 3x 400-480V 1.0A 0.45kW, line filter, braking resistor and electronic secure restart inhibit integrated | 1274 |
| 8V1010.001-2 | Servo drive 3x 400-480V, 1.0A, 0.45kW, line filter, braking resistor and electronic secure restart inhibit integrated, coated | 1274 |
| 8V1016.00-2 | Servo drive 3x 400-480V, 1.6A, 0.7kW, line filter, braking resistor and electronic secure restart inhibit integrated | 1274 |
| 8V1016.001-2 | Servo drive 3x 400-480V, 1.6A, 0.7kW, line filter, braking resistor and electronic secure restart inhibit integrated, coated | 1274 |

| Model number | Short description | |
|---|---|---|
| 8V1022.00-2 | Servo drive 3x 400-480V, 2.2A, 1kW, line filter, braking resistor and electronic secure restart inhibit integrated | 1278 |
| 8V1022.001-2 | Servo drive 3x 400-480V, 2.2A, 1kW, line filter, braking resistor and electronic secure restart inhibit integrated, coated | 1278 |
| 8V1045.00-2 | Servo drive 3x 400-480V, 4.4A, 2kW, line filter, braking resistor and electronic secure restart inhibit integrated | 1278 |
| 8V1045.001-2 | Servo drive 3x 400-480V, 4.4A, 2kW, line filter, braking resistor and electronic secure restart inhibit integrated, coated | 1278 |
| 8V1090.00-2 | Servo drive 3x 400-480V, 8.8A, 4kW, line filter, braking resistor and electronic secure restart inhibit integrated | 1278 |
| 8V1090.001-2 | Servo drive 3x 400-480V, 8.8A, 4kW, line filter, braking resistor and electronic secure restart inhibit integrated, coated | 1278 |

| Model number | Short description | |
|---|---|---|
| 8V1180.00-2 | Servo drive 3x 400-480V, 19A, 9kW, line filter, braking resistor, DC bus power supply and electronic secure restart inhibit integrated | 1282 |
| 8V1180.001-2 | Servo drive 3x 400-480V, 34A, 16kW, line filter, braking resistor, DC bus power supply and electronic secure restart inhibit integrated, coated | 1282 |
| 8V1320.00-2 | Servo drive 3x 400-480V, 34A, 16kW, line filter, braking resistor, DC bus power supply and electronic secure restart inhibit integrated | 1282 |
| 8V1320.001-2 | Servo drive 3x 400-480V, 34A, 16kW, line filter, braking resistor, DC bus power supply and electronic secure restart inhibit integrated, coated | 1282 |

| Model number | Short description | |
|---|---|---|
| 8V1640.00-2 | Servo drive 3x 400-480V, 64A, 32kW, line filter, braking resistor, DC bus power supply and electronic secure restart inhibit integrated | 1286 |
| 8V1640.001-2 | Servo drive 3x 400-480V, 64A, 32kW, line filter, braking resistor, DC bus power supply and electronic secure restart inhibit integrated, coated | 1286 |
| 8V128M.00-2 | Servo drive 3x 400-480V, 128A, 64kW, line filter, braking resistor, DC bus power supply and electronic secure restart inhibit integrated | 1286 |
| 8V128M.001-2 | Servo drive 3x 400-480V, 128A, 64kW, line filter, braking resistor, DC bus power supply and electronic secure restart inhibit integrated, coated | 1286 |

# ACOPOS plug-in modules

## Network modules

| Model number | Short description | |
|---|---|---|
| 8AC110.60-2 | ACOPOS plug-in module, CAN interface | 1290 |
| 8AC114.60-2 | ACOPOS plug-in module, POWERLINK V2 interface | 1291 |

## Encoder modules

| Model number | Short description | |
|---|---|---|
| 8AC120.60-1 | ACOPOS insert module, EnDat encoder and sine incremental encoder interface | 1292 |
| 8AC121.60-1 | ACOPOS plug-in module, HIPERFACE interface | 1294 |
| 8AC122.60-3 | ACOPOS plug-in module, resolver interface | 1296 |
| 8AC123.60-1 | ACOPOS plug-in module, incremental encoder and SSI absolute encoder interface | 1298 |

## I/O modules

| Model number | Short description | |
|---|---|---|
| 8AC130.60-1 | ACOPOS plug-in module, 8 digital I/O configurable in pairs as 24V input or as output 400/100 mA, 2 digital outputs 2A, order TB712 terminal block separately. | 1300 |
| 8AC131.60-1 | ACOPOS plug-in module, 2 analog inputs ±10V, 2 digital I/O points which can be configured as a 24V input or 45 mA output, order TB712 terminal block separately. | 1303 |

## CPU modules

| Model number | Short description | |
|---|---|---|
| 8AC140.60-2 | ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately. | 1306 |
| 8AC140.60-3 | ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 32MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately. | 1306 |
| 8AC140.61-3 | ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately. | 1306 |
| 8AC141.60-2 | ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input ±10V, order program memory and 0TB704 and 0TB708 terminal blocks separately. | 1310 |
| 8AC141.61-3 | ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input ±10V, order program memory and 0TB704 and 0TB708 terminal blocks separately. | 1310 |

# Product overview

## Accessories

### Motor cables 1.5 mm²

| Model number | Short description | |
|---|---|---|
| 8CM005.12-1 | Motor cable, length 5 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed | 1314 |
| 8CM007.12-1 | Motor cable, length 7 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed | 1314 |
| 8CM010.12-1 | Motor cable, length 10 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed | 1314 |
| 8CM015.12-1 | Motor cable, length 15 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed | 1314 |
| 8CM020.12-1 | Motor cable, length 20 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed | 1314 |
| 8CM025.12-1 | Motor cable, length 25 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed | 1314 |

### Motor cables 4 mm²

| Model number | Short description | |
|---|---|---|
| 8CM005.12-3 | Motor cable, length 5 m, 4 x 4 mm² + 2 x 2 x 1 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed | 1315 |
| 8CM007.12-3 | Motor cable, length 7 m, 4 x 4 mm² + 2 x 2 x 1 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed | 1315 |
| 8CM010.12-3 | Motor cable, length 10 m, 4 x 4 mm² + 2 x 2 x 1 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed | 1315 |
| 8CM015.12-3 | Motor cable, length 15 m, 4 x 4 mm² + 2 x 2 x 1 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed | 1315 |
| 8CM020.12-3 | Motor cable, length 20 m, 4 x 4 mm² + 2 x 2 x 1 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed | 1315 |
| 8CM025.12-3 | Motor cable, length 25 m, 4 x 4 mm² + 2 x 2 x 1 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed | 1315 |

### Motor cables 10 mm²

| Model number | Short description | |
|---|---|---|
| 8CM005.12-5 | Motor cable, length 5 m, 4 x 10 mm² + 2 x 2 x 1.5 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed | 1316 |
| 8CM007.12-5 | Motor cable, length 7 m, 4 x 10 mm² + 2 x 2 x 1.5 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed | 1316 |
| 8CM010.12-5 | Motor cable, length 10 m, 4 x 10 mm² + 2 x 2 x 1.5 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed | 1316 |
| 8CM015.12-5 | Motor cable, length 15 m, 4 x 10 mm² + 2 x 2 x 1.5 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed | 1316 |
| 8CM020.12-5 | Motor cable, length 20 m, 4 x 10 mm² + 2 x 2 x 1.5 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed | 1316 |
| 8CM025.12-5 | Motor cable, length 25 m, 4 x 10 mm² + 2 x 2 x 1.5 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed | 1316 |

### Motor cables 35 mm²

| Model number | Short description | |
|---|---|---|
| 8CM005.12-8 | Motor cable, length 5 m, 4 x 35 mm² + 2 x 2 x 1.5 mm², can be used in drag chains, UL/CSA listed | 1317 |
| 8CM007.12-8 | Motor cable, length 7 m, 4 x 35 mm² + 2 x 2 x 1.5 mm², can be used in drag chains, UL/CSA listed | 1317 |
| 8CM010.12-8 | Motor cable, length 10 m, 4 x 35 mm² + 2 x 2 x 1.5 mm², can be used in drag chains, UL/CSA listed | 1317 |
| 8CM015.12-8 | Motor cable, length 15 m, 4 x 35 mm² + 2 x 2 x 1.5 mm², can be used in drag chains, UL/CSA listed | 1317 |
| 8CM020.12-8 | Motor cable, length 20 m, 4 x 35 mm² + 2 x 2 x 1.5 mm², can be used in drag chains, UL/CSA listed | 1317 |
| 8CM025.12-8 | Motor cable, length 25 m, 4 x 35 mm² + 2 x 2 x 1.5 mm², can be used in drag chains, UL/CSA listed | 1317 |

## EnDat cables

| Model number | Short description | |
|---|---|---|
| 8CE005.12-1 | EnDat cable, length 5 m, 10 x 0.14 mm² + 2 x 0.5 mm², EnDat plug 17-pin Intercontec socket, servo connector 15-pin DSUB plug, can be used in cable drag claims, UL/CSA certified | 1318 |
| 8CE007.12-1 | EnDat cable, length 7 m, 10 x 0.14 mm² + 2 x 0.5 mm², EnDat plug 17-pin Intercontec socket, servo connector 15-pin DSUB plug, can be used in cable drag claims, UL/CSA certified | 1318 |
| 8CE010.12-1 | EnDat cable, length 10 m, 10 x 0.14 mm² + 2 x 0.5 mm², EnDat plug 17-pin Intercontec socket, servo connector 15-pin DSUB plug, can be used in cable drag claims, UL/CSA certified | 1318 |
| 8CE015.12-1 | EnDat cable, length 15 m, 10 x 0.14 mm² + 2 x 0.5 mm², EnDat plug 17-pin Intercontec socket, servo connector 15-pin DSUB plug, can be used in cable drag claims, UL/CSA certified | 1318 |
| 8CE020.12-1 | EnDat cable, length 20 m, 10 x 0.14 mm² + 2 x 0.5 mm², EnDat plug 17-pin Intercontec socket, servo connector 15-pin DSUB plug, can be used in cable drag claims, UL/CSA certified | 1318 |
| 8CE025.12-1 | EnDat cable, length 25 m, 10 x 0.14 mm² + 2 x 0.5 mm², EnDat plug 17-pin Intercontec socket, servo connector 15-pin DSUB plug, can be used in cable drag claims, UL/CSA certified | 1318 |

## Resolver cables

| Model number | Short description | |
|---|---|---|
| 8CR005.12-1 | Resolver cable, length 5 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA certified | 1319 |
| 8CR007.12-1 | Resolver cable, length 7 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA certified | 1319 |
| 8CR010.12-1 | Resolver cable, length 10 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA certified | 1319 |
| 8CR015.12-1 | Resolver cable, length 15 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA certified | 1319 |
| 8CR020.12-1 | Resolver cable, length 20 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA certified | 1319 |
| 8CR025.12-1 | Resolver cable, length 25 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA certified | 1319 |

# Single-phase servo drives
# 8V1010, 8V1016

8V1010.5xx-2

8V1016.5xx-2

- Designed for operation on a single-phase or three-phase power mains
- Modular mechanical structure plug-in modules
- Integrated power filter
- Integrated braking resistor
- Integrated electronic restart inhibit

| **General information** | **8V1010.50-2, 8V1010.501-2** | **8V1016.50-2, 8V1016.501-2** |
|---|---|---|
| C-UL-US listed | Yes | Yes |
| **Power mains connection** | **8V1010.50-2, 8V1010.501-2** | **8V1016.50-2, 8V1016.501-2** |
| Mains input voltage | 3x 110 VAC to 230 VAC ±10% or<br>1x 110 VAC to 230 VAC ±10%, power filter according to EN 61800-3-A11 second environment (limits from CISPR11, group 2, class A) | 3x 110 VAC to 230 VAC ±10% or<br>1x 110 VAC to 230 VAC ± 10% power filter according to EN 61800-3-A11 second environment (limits from CISPR11, group 2, class A) |
| Frequency | 50 / 60 Hz ± 4% | 50 / 60 Hz ± 4% |
| Installed load | Max. 1.35 kVA | Max. 2.1 kVA |
| Starting current | 5 A (at 230 VAC) | 5 A (at 230 VAC) |
| Switch-on interval | > 10 sec | > 10 sec |
| Power loss at max. device power without braking resistor | 80 W | 110 W |
| **24 VDC supply** | **8V1010.50-2, 8V1010.501-2** | **8V1016.50-2, 8V1016.501-2** |
| Input voltage [1] | 24 VDC +25% / -20% | 24 VDC +25% / -20% |
| Input capacitance | 5600 µF | 5600 µF |
| Current consumption [2] | Max. 1.47 A + current for motor holding brake | Max. 1.47 A + current for motor holding brake |

1) When using motor holding brakes, the valid input voltage range is reduced. The input voltage range should be selected so that the proper supply voltage for the motor holding brake can be maintained.

2) The current requirements depend on the configuration of the ACOPOS servo drive.

| **DC bus** | **8V1010.50-2, 8V1010.501-2** | **8V1016.50-2, 8V1016.501-2** |
|---|---|---|
| DC bus capacitance | 2040 µF | 2040 µF |
| **Motor connector** | **8V1010.50-2, 8V1010.501-2** | **8V1016.50-2, 8V1016.501-2** |
| Continuous current [1] | 2.3 $A_{eff}$ | 3.6 $A_{eff}$ |
| Reduction of continuous current depending on ambient temperature [2] | | |
| Mains input voltage: 400 VAC | | |
| Switching frequency 20 kHz | No reduction | No reduction |
| Switching frequency 10 kHz | **No reduction** | **No reduction** |
| Switching frequency 5 kHz | No reduction | No reduction |
| Mains input voltage: 480 VAC | | |
| Switching frequency 20 kHz | No reduction | No reduction |
| Switching frequency 10 kHz | **No reduction** | **No reduction** |
| Switching frequency 5 kHz | No reduction | No reduction |
| Reduction of continuous current depending on altitude | | |
| starting at 500 m above sea level | 0.23 $A_{eff}$ per 1000 m | 0.36 $A_{eff}$ per 1000 m |
| Maximum current | 7.8 $A_{eff}$ | 12 $A_{eff}$ |
| Rated switching frequency | 10 kHz | 10 kHz |
| Maximum motor line length | 15 m | 15 m |
| Protective measures | Short circuit & overload protection | Short circuit & overload protection |

1) Valid in the following conditions: Mains input voltage 230 VAC, nominal switching frequency, 40° C ambient temperature, installation altitudes < 500 m above sea level.2) The nominal switching frequency values for the respective ACOPOS servo drive are marked in bold.

| **Motor holding brake connection** | **8V1010.50-2, 8V1010.501-2** | **8V1016.50-2, 8V1016.501-2** |
|---|---|---|
| Maximum output current | 1.3 A | 1.3 A |
| Max. number of switching cycles | Unlimited since done electronically | Unlimited since done electronically |
| **Braking resistor** | **8V1010.50-2, 8V1010.501-2** | **8V1016.50-2, 8V1016.501-2** |
| Peak power output | 1.9 kW | 1.9 kW |
| Continuous power | 130 W | 130 W |

| Trigger inputs | 8V1010.50-2, 8V1010.501-2 | 8V1016.50-2, 8V1016.501-2 |
|---|---|---|
| Number of inputs | 2 | 2 |
| Wiring | Sink | Sink |
| Electrical isolation | | |
| Input – ACOPOS | Yes | Yes |
| Input – Input | No | No |
| Input voltage | | |
| Rated | 24 VDC | 24 VDC |
| Maximum | 30 VDC | 30 VDC |
| Switching threshold | | |
| LOW | < 5 V | < 5 V |
| HIGH | >15 V | >15 V |
| Input current at rated voltage | Approx. 10 mA | Approx. 10 mA |
| Switching delay | | |
| Positive edge | 52 µs ± 0.5 µs (digitally filtered) | 52 µs ± 0.5 µs (digitally filtered) |
| Negative edge | 53 µs ± 0.5 µs (digitally filtered) | 53 µs ± 0.5 µs (digitally filtered) |
| Modulation compared to ground potential | Max. ±38 V | Max. ±38 V |
| **Limit switch and reference inputs** | **8V1010.50-2, 8V1010.501-2** | **8V1016.50-2, 8V1016.501-2** |
| Number of inputs | 3 | 3 |
| Wiring | Sink | Sink |
| Electrical isolation | | |
| Input - ACOPOS | Yes | Yes |
| Input - Input | No | No |
| Input voltage | | |
| Rated | 24 VDC | 24 VDC |
| Maximum | 30 VDC | 30 VDC |
| Switching threshold | | |
| LOW | < 5 V | < 5 V |
| HIGH | >15 V | >15 V |
| Input current at rated voltage | Approx. 4 mA | Approx. 4 mA |
| Switching delay | Max. 2.0 ms | Max. 2.0 ms |
| Modulation compared to ground potential | Max. ±38 V | Max. ±38 V |
| **Enable input** | **8V1010.50-2, 8V1010.501-2** | **8V1016.50-2, 8V1016.501-2** |
| Number of inputs | 1 | 1 |
| Wiring | Sink | Sink |
| Electrical isolation | | |
| Input - ACOPOS | Yes | Yes |
| Input voltage | | |
| Rated | 24 VDC | 24 VDC |
| Maximum | 30 VDC | 30 VDC |
| Switching threshold | | |
| LOW | < 5 V | < 5 V |
| HIGH | >15 V | >15 V |
| Input current at rated voltage | Approx. 30 mA | Approx. 30 mA |
| Switching delay | | |
| Enable 1 -> 0, PWM off | Max. 2.0 ms | Max. 2.0 ms |
| Enable 0 -> 1, ready for PWM | Max. 100 µs | Max. 100 µs |
| Modulation compared to ground potential | Max. ±38 V | Max. ±38 V |

# Single-phase servo drives
# 8V1010, 8V1016

| Operational conditions | 8V1010.50-2, 8V1010.501-2 | 8V1016.50-2, 8V1016.501-2 |
|---|---|---|
| Ambient temperature during operation | 5 to 40°C | 5 to 40°C |
| Max. ambient temperature [1] | +55°C | +55°C |
| Relative humidity during operation | 5 to 85%, non-condensing | 5 to 85%, non-condensing |
| Installation at altitudes above sea level | 0 to 500 m | 0 to 500 m |
| Maximum installation altitude [2] | 2000 m | 2000 m |
| Degree of pollution according to EN 60664-1 | 2 (non-conductive material) | 2 (non-conductive material) |
| Overvoltage cat. according to IEC 60364-4-443:1999 | II | II |
| EN 60529 protection | IP20 | IP20 |

1) Continuous operation of ACOPOS servo drives at an ambient temperature ranging from 40°C to 55°C is possible (taking the continuous current reductions listed into consideration), but results in a shorter lifespan.

2) Continuous operation of ACOPOS servo drives at altitudes ranging from 500 m to 2000 m above sea level is possible (taking the continuous current reductions listed into consideration). Additional requirements are to be arranged with B&R.

| Storage and transport conditions | 8V1010.50-2, 8V1010.501-2 | 8V1016.50-2, 8V1016.501-2 |
|---|---|---|
| Storage temperature | -25 to +55°C | -25 to +55°C |
| Relative humidity during storage | 5 to 95%, non-condensing | 5 to 95%, non-condensing |
| Transport temperature | -25 to +70°C | -25 to +70°C |
| Relative humidity during transport | 95% at +40°C | 95% at +40°C |

| Mechanical characteristics | 8V1010.50-2, 8V1010.501-2 | 8V1016.50-2, 8V1016.501-2 |
|---|---|---|
| Dimensions | | |
| Width | 58.5 mm | 58.5 mm |
| Height | 257 mm | 257 mm |
| Depth | 220 mm | 220 mm |
| Weight | 2.5 kg | 2.5 kg |

| Optional accessories | | |
|---|---|---|
| 8AC110.60-2 | ACOPOS plug-in module, CAN interface | 1290 |
| 8AC114.60-2 | ACOPOS plug-in module, POWERLINK V2 interface | 1291 |
| 8AC120.60-1 | ACOPOS insert module, EnDat encoder and sine incremental encoder interface | 1292 |
| 8AC121.60-1 | ACOPOS plug-in module, HIPERFACE interface | 1294 |
| 8AC122.60-3 | ACOPOS plug-in module, resolver interface | 1296 |
| 8AC123.60-1 | ACOPOS plug-in module, incremental encoder and SSI absolute encoder interface | 1298 |
| 8AC130.60-1 | ACOPOS insert module, 8 digital I/O configurable in pairs as 24V input or as 400/100 mA output, 2 digital outputs 2A, order TB712 terminal blocks separately. | 1300 |
| 8AC131.60-1 | ACOPOS plug-in module, 2 analog inputs ±10V, 2 digital I/O points which can be configured as a 24V input or as 45 mA output, order TB712 terminal blocks separately. | 1303 |
| 8AC140.60-2 | ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately. | 1306 |
| 8AC140.60-3 | ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 32MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately. | 1306 |
| 8AC140.61-3 | ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately. | 1306 |
| 8AC141.60-2 | ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input ±10V, order program memory and 0TB704 and 0TB708 terminal blocks separately. | 1310 |
| 8AC141.61-3 | ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input ±10V, order program memory and 0TB704 and 0TB708 terminal blocks separately. | 1310 |
| 0PS320.1 | 24 VDC power supply, 3-phase, 20 A, input 400..500 VAC (3 phases), wide range, DIN rail mounting | 659 |
| 8CM005.12-1 | Motor cable, length 5 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified | 1314 |
| 8CM007.12-1 | Motor cable, length 7 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified | 1314 |
| 8CM010.12-1 | Motor cable, length 10 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified | 1314 |
| 8CM015.12-1 | Motor cable, length 15 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified | 1314 |

# Servo drives
# 8V1010, 8V1016

8V1010.0xx-2

8V1016.0xx-2

- Modular mechanical structure using insert modules
- Integrated power filter
- Integrated braking resistor
- Integrated electronic restart inhibit

| General information | 8V1010.00-2, 8V1010.001-2 | 8V1016.00-2, 8V1016.001-2 |
|---|---|---|
| C-UL-US listed | Yes | Yes |
| **Power mains connection** | **8V1010.00-2, 8V1010.001-2** | **8V1016.00-2, 8V1016.001-2** |
| Mains input voltage | 3x 400 VAC to 480 VAC ±10%, power filter according to EN 61800-3-A11 second environment (limits from CISPR11, group 2, class A) | 3x 400 VAC to 480 VAC ±10%, power filter according to EN 61800-3-A11 second environment (limits from CISPR11, group 2, class A) |
| Frequency | 50 / 60 Hz ± 4% | 50 / 60 Hz ± 4% |
| Installed load | Max. 1.35 kVA | Max. 2.1 kVA |
| Starting current | 2 A (at 400 VAC) | 2 A (at 400 VAC) |
| Switch-on interval | > 10 sec | > 10 sec |
| Power loss at max. device power without Braking resistor | 80 W | 110 W |
| **24 VDC supply** | **8V1010.00-2, 8V1010.001-2** | **8V1016.00-2, 8V1016.001-2** |
| Input voltage [1] | 24 VDC +25% / -20% | 24 VDC +25% / -20% |
| Input capacitance | 5600 µF | 5600 µF |
| Current consumption [2] | Max. 1.47 A + current for motor holding brake | Max. 1.47 A + current for motor holding brake |

1)When using motor holding brakes, the valid input voltage range is reduced. The input voltage range should be selected so that the proper supply voltage for the motor holding brake can be maintained.

2) The current requirements depend on the configuration of the ACOPOS servo drive.

| DC bus | 8V1010.00-2, 8V1010.001-2 | 8V1016.00-2, 8V1016.001-2 |
|---|---|---|
| DC bus capacitance | 165 µF | 165 µF |
| **Motor connector** | **8V1010.00-2, 8V1010.001-2** | **8V1016.00-2, 8V1016.001-2** |
| Continuous current [1] | 1 $A_{eff}$ | 1.6 $A_{eff}$ |
| Reduction of continuous current depending on the ambient temperature [2] | | |
| Mains input voltage: 400 VAC | | |
| Switching frequency 20 kHz | No reduction | No reduction |
| Switching frequency 10 kHz | **No reduction** | **No reduction** |
| Switching frequency 5 kHz | No reduction | No reduction |
| Mains input voltage: 480 VAC | | |
| Switching frequency 20 kHz | 0.13 $A_{eff}$ per °C (starting at 45° C) | 0.13 $A_{eff}$ per °C (starting from 40°C) |
| Switching frequency 10 kHz | **No reduction** | **No reduction** |
| Switching frequency 5 kHz | No reduction | No reduction |
| Reduction of continuous current depending on Installation altitude greater than 500 m above sea level | 0.1 $A_{eff}$ per 1000 m | 0.16 $A_{eff}$ per 1000 m |
| Maximum current | 2.8 $A_{eff}$ | 5 $A_{eff}$ |
| Rated switching frequency | 10 kHz | 10 kHz |
| Maximum motor line length | 15 m | 15 m |
| Protective measures | Short circuit and overload protection | Short circuit and overload protection |

1) Valid in the following conditions: Mains input voltage 400 VAC, nominal switching frequency, 40°C ambient temperature, installation altitudes < 500 m above sea level.

2) The nominal switching frequency values for the respective ACOPOS servo drive are marked in bold.

| Motor holding brake connection | 8V1010.00-2, 8V1010.001-2 | 8V1016.00-2, 8V1016.001-2 |
|---|---|---|
| Maximum output current | 1.3 A | 1.3 A |
| Max. number of switching cycles | Unlimited since done electronically | Unlimited since done electronically |
| **Braking resistor** | **8V1010.00-2, 8V1010.001-2** | **8V1016.00-2, 8V1016.001-2** |
| Peak power output | 2 kW | 2 kW |
| Continuous power | 130 W | 130 W |

| Trigger inputs | 8V1010.00-2, 8V1010.001-2 | 8V1016.00-2, 8V1016.001-2 |
|---|---|---|
| Number of inputs | 2 | 2 |
| Wiring | Sink | Sink |
| Electrical isolation | | |
| Input - ACOPOS | Yes | Yes |
| Input - Input | No | No |
| Input voltage | | |
| Rated | 24 VDC | 24 VDC |
| Maximum | 30 VDC | 30 VDC |
| Switching threshold | | |
| LOW | < 5 V | < 5 V |
| HIGH | >15 V | >15 V |
| Input current at rated voltage | Approx. 10 mA | Approx. 10 mA |
| Switching delay | | |
| Positive edge | 52 µs ± 0.5 µs (digitally filtered) | 52 µs ± 0.5 µs (digitally filtered) |
| Negative edge | 53 µs ± 0.5 µs (digitally filtered) | 53 µs ± 0.5 µs (digitally filtered) |
| Modulation compared to ground potential | Max. ±38 V | Max. ±38 V |
| **Limit switch and reference inputs** | **8V1010.00-2, 8V1010.001-2** | **8V1016.00-2, 8V1016.001-2** |
| Number of inputs | 3 | 3 |
| Wiring | Sink | Sink |
| Electrical isolation | | |
| Input - ACOPOS | Yes | Yes |
| Input - Input | No | No |
| Input voltage | | |
| Rated | 24 VDC | 24 VDC |
| Maximum | 30 VDC | 30 VDC |
| Switching threshold | | |
| LOW | < 5 V | < 5 V |
| HIGH | >15 V | >15 V |
| Input current at rated voltage | Approx. 4 mA | Approx. 4 mA |
| Switching delay | Max. 2.0 ms | Max. 2.0 ms |
| Modulation compared to ground potential | Max. ±38 V | Max. ±38 V |
| **Enable input** | **8V1010.00-2, 8V1010.001-2** | **8V1016.00-2, 8V1016.001-2** |
| Number of inputs | 1 | 1 |
| Wiring | Sink | Sink |
| Electrical isolation | | |
| Input - ACOPOS | Yes | Yes |
| Input voltage | | |
| Rated | 24 VDC | 24 VDC |
| Maximum | 30 VDC | 30 VDC |
| Switching threshold | | |
| LOW | < 5 V | < 5 V |
| HIGH | >15 V | >15 V |
| Input current at rated voltage | Approx. 30 mA | Approx. 30 mA |
| Switching delay | | |
| Enable 1 -> 0, PWM off | Max. 2.0 ms | Max. 2.0 ms |
| Enable 0 -> 1, ready for PWM | Max. 100 µs | Max. 100 µs |
| Modulation compared to ground potential | Max. ±38 V | Max. ±38 V |

# Servo drives
# 8V1010, 8V1016

| Operational conditions | 8V1010.00-2, 8V1010.001-2 | 8V1016.00-2, 8V1016.001-2 |
|---|---|---|
| Ambient temperature during operation | 5 to 40°C | 5 to 40°C |
| Max. ambient temperature [1] | +55°C | +55°C |
| Relative humidity during operation | 5 to 85%, non-condensing | 5 to 85%, non-condensing |
| Installation at altitudes above sea level | 0 to 500 m | 0 to 500 m |
| Maximum installation altitude [2] | 2000 m | 2000 m |
| Degree of pollution according to EN 60664-1 | 2 (non-conductive material) | 2 (non-conductive material) |
| Overvoltage cat. according to IEC 60364-4-443:1999 | II | II |
| EN 60529 protection | IP20 | IP20 |

1) Continuous operation of ACOPOS servo drives at an ambient temperature ranging from 40°C to 55°C is possible (taking the continuous current reductions listed into consideration), but results in a shorter lifespan.

2) Continuous operation of ACOPOS servo drives at altitudes ranging from 500 m to 2000 m above sea level is possible (taking the continuous current reductions listed into consideration). Additional requirements are to be arranged with B&R.

| Storage and transport conditions | 8V1010.00-2, 8V1010.001-2 | 8V1016.00-2, 8V1016.001-2 |
|---|---|---|
| Storage temperature | -25 to +55°C | -25 to +55°C |
| Relative humidity during storage | 5 to 95%, non-condensing | 5 to 95%, non-condensing |
| Transport temperature | -25 to +70°C | -25 to +70°C |
| Relative humidity during transport | 95% at +40°C | 95% at +40°C |

| Mechanical characteristics | 8V1010.00-2, 8V1010.001-2 | 8V1016.00-2, 8V1016.001-2 |
|---|---|---|
| Dimensions | | |
| Width | 58.5 mm | 58.5 mm |
| Height | 257 mm | 257 mm |
| Depth | 220 mm | 220 mm |
| Weight | 2.5 kg | 2.5 kg |

| Optional accessories | | |
|---|---|---|
| 8AC110.60-2 | ACOPOS plug-in module, CAN interface | 1290 |
| 8AC114.60-2 | ACOPOS plug-in module, POWERLINK V2 interface | 1291 |
| 8AC120.60-1 | ACOPOS insert module, EnDat encoder and sine incremental encoder interface | 1292 |
| 8AC121.60-1 | ACOPOS plug-in module, HIPERFACE interface | 1294 |
| 8AC122.60-3 | ACOPOS plug-in module, resolver interface | 1296 |
| 8AC123.60-1 | ACOPOS plug-in module, incremental encoder and SSI absolute encoder interface | 1298 |
| 8AC130.60-1 | ACOPOS insert module, 8 digital I/O configurable in pairs as 24V input or as 400/100 mA output, 2 digital outputs 2A, order TB712 terminal blocks separately | 1300 |
| 8AC131.60-1 | ACOPOS plug-in module, 2 analog inputs ±10V, 2 digital I/O points which can be configured as a 24V input or as 45 mA output, order TB712 terminal blocks separately | 1303 |
| 8AC140.60-2 | ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Profibus-DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately | 1306 |
| 8AC140.60-3 | ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 32MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately. | 1306 |
| 8AC140.61-3 | ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately | 1306 |
| 8AC141.60-2 | ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link master interface, 3 digital I/O points can be configured as a 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB704 and 0TB708 terminal blocks separately | 1310 |
| 8AC141.61-3 | ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input ±10V, order program memory and 0TB704 and 0TB708 terminal blocks separately. | 1310 |
| 0PS320.1 | 24 VDC power supply, 3-phase, 20 A, input 400..500 VAC (3 phases), wide range, DIN rail mounting | 659 |
| 8CM005.12-1 | Motor cable, length 5 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified | 1314 |
| 8CM007.12-1 | Motor cable, length 7 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified | 1314 |
| 8CM010.12-1 | Motor cable, length 10 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified | 1314 |
| 8CM015.12-1 | Motor cable, length 15 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified | 1314 |

# Servo drives
# 8V1022, 8V1045, 8V1090

8V1022.0xx-2

8V1045.0xx-2

8V1090.0xx-2

- Modular mechanical structure using insert modules
- Integrated power filter
- Integrated braking resistor
- All connections made using plug-in connectors
- Integrated electronic restart inhibit

| **General information** | **8V1022.00-2, 8V1022.001-2** | **8V1045.00-2, 8V1045.001-2** | **8V1090.00-2, 8V1090.001-2** |
|---|---|---|---|
| C-UL-US listed | Yes | Yes | Yes |
| **Power mains connection** | **8V1022.00-2, 8V1022.001-2** | **8V1045.00-2, 8V1045.001-2** | **8V1090.00-2, 8V1090.001-2** |
| Mains input voltage | 3x 400 VAC to 480 VAC ± 10% power filter according to EN 61800-3-A11 second environment (limits from CISPR11, group 2, class A) | 3x 400 VAC to 480 VAC ± 10% power filter according to EN 61800-3-A11 second environment (limits from CISPR11, group 2, class A) | 3x 400 VAC to 480 VAC ± 10% power filter according to EN 61800-3-A11 second environment (limits from CISPR11, group 2, class A) |
| Frequency | 50 / 60 Hz ± 4% | 50 / 60 Hz ± 4% | 50 / 60 Hz ± 4% |
| Installed load | Max. 3 kVA | Max. 5 kVA | Max. 10 kVA |
| Starting current at 400 VAC | 4 A | 7 A | 7 A |
| Switch-on interval | > 10 sec | > 10 sec | > 10 sec |
| Power loss at max. device power without braking resistor | Approx. 120 W | Approx. 180 W | Approx. 200 W |
| **24 VDC supply** | **8V1022.00-2, 8V1022.001-2** | **8V1045.00-2, 8V1045.001-2** | **8V1090.00-2, 8V1090.001-2** |
| Input voltage [1] | 24 VDC +25% / -25% | 24 VDC +25% / -25% | 24 VDC +25% / -25% |
| Input capacitance | 8200 µF | 8200 µF | 8200 µF |
| Current consumption [2] | Max. 2.5 A + current for motor holding brake | Max. 2.5 A + current for motor holding brake | Max. 2.5 A + current for motor holding brake |

1) When using motor holding brakes, the valid input voltage range is reduced. The input voltage range should be selected so that the proper supply voltage for the motor holding brake can be maintained.

2) The current requirements depend on the configuration of the ACOPOS servo drive.

| **DC bus** | **8V1022.00-2, 8V1022.001-2** | **8V1045.00-2, 8V1045.001-2** | **8V1090.00-2, 8V1090.001-2** |
|---|---|---|---|
| DC bus capacitance | 235 µF | 235 µF | 470 µF |
| **Motor connector** | **8V1022.00-2, 8V1022.001-2** | **8V1045.00-2, 8V1045.001-2** | **8V1090.00-2, 8V1090.001-2** |
| Continuous current [1] | 2.2 $A_{eff}$ | 4.4 $A_{eff}$ | 8.8 $A_{eff}$ |
| Reduction of continuous current depending on the ambient temperature [2] | | | |
| Mains input voltage: 400 VAC | | | |
| Switching frequency 20 kHz | **No reduction** | **0.13 $A_{eff}$ per °C (from 45°C)** | 0.18 $A_{eff}$ per °C (from 30°C) |
| Switching frequency 10 kHz | No reduction | No reduction | **0.18 $A_{eff}$ per °C (from 54°C)** |
| Switching frequency 5 kHz | No reduction | No reduction | No reduction |
| Mains input voltage: 480 VAC | | | |
| Switching frequency 20 kHz | **0.13 $A_{eff}$ per °C (from 51°C)** | **0.13 $A_{eff}$ per °C (from 35°C)** | 0.18 $A_{eff}$ per °C (from 18°C) |
| Switching frequency 10 kHz | No reduction | No reduction | **0.18 $A_{eff}$ per °C (from 48°C)** |
| Switching frequency 5 kHz | No reduction | No reduction | No reduction |
| Reduction of continuous current depending on altitude | | | |
| Starting at 500 m above sea level | 0.22 $A_{eff}$ per 1000 m | 0.44 $A_{eff}$ per 1000 m | 0.88 $A_{eff}$ per 1000 m |
| Maximum current | 14 $A_{eff}$ | 24 $A_{eff}$ | 24 $A_{eff}$ |
| Rated switching frequency | 20 kHz | 20 kHz | 10 kHz |
| Maximum motor line length | 25 m | 25 m | 25 m |
| Protective measures | Short circuit & overload protection | Short circuit & overload protection | Short circuit & overload protection |

1) Valid in the following conditions: Mains input voltage 400 VAC, nominal switching frequency, 40° C ambient temperature, installation altitudes < 500 m above sea level.2) The nominal switching frequency values for the respective ACOPOS servo drive are marked in bold.

| **Motor holding brake connection** | **8V1022.00-2, 8V1022.001-2** | **8V1045.00-2, 8V1045.001-2** | **8V1090.00-2, 8V1090.001-2** |
|---|---|---|---|
| Maximum output current | 1 A | 1 A | 1 A |
| Max. number of switching cycles | Approx. 240,000 | Approx. 240,000 | Approx. 240,000 |
| **Braking resistor** | **8V1022.00-2, 8V1022.001-2** | **8V1045.00-2, 8V1045.001-2** | **8V1090.00-2, 8V1090.001-2** |
| Peak power output | 3.5 kW | 7 kW | 7 kW |
| Continuous power | 130 W | 200 W | 200 W |

| Trigger inputs | 8V1022.00-2, 8V1022.001-2 | 8V1045.00-2, 8V1045.001-2 | 8V1090.00-2, 8V1090.001-2 |
|---|---|---|---|
| Number of inputs | 2 | 2 | 2 |
| Wiring | Sink | Sink | Sink |
| Electrical isolation | | | |
| Input - ACOPOS | Yes | Yes | Yes |
| Input - Input | No | No | No |
| Input voltage | | | |
| Rated | 24 VDC | 24 VDC | 24 VDC |
| Maximum | 30 VDC | 30 VDC | 30 VDC |
| Switching threshold | | | |
| LOW | < 5 V | < 5 V | < 5 V |
| HIGH | >15 V | >15 V | >15 V |
| Input current at rated voltage | Approx. 10 mA | Approx. 10 mA | Approx. 10 mA |
| Switching delay | | | |
| Positive edge | 52 µs ± 0.5 µs (digitally filtered) | 52 µs ± 0.5 µs (digitally filtered) | 52 µs ± 0.5 µs (digitally filtered) |
| Negative edge | 53 µs ± 0.5 µs (digitally filtered) | 53 µs ± 0.5 µs (digitally filtered) | 53 µs ± 0.5 µs (digitally filtered) |
| Modulation compared to ground potential | Max. ±38 V | Max. ±38 V | Max. ±38 V |
| **Limit switch and reference inputs** | **8V1022.00-2, 8V1022.001-2** | **8V1045.00-2, 8V1045.001-2** | **8V1090.00-2, 8V1090.001-2** |
| Number of inputs | 3 | 3 | 3 |
| Wiring | Sink | Sink | Sink |
| Electrical isolation | | | |
| Input - ACOPOS | Yes | Yes | Yes |
| Input - Input | No | No | No |
| Input voltage | | | |
| Rated | 24 VDC | 24 VDC | 24 VDC |
| Maximum | 30 VDC | 30 VDC | 30 VDC |
| Switching threshold | | | |
| LOW | < 5 V | < 5 V | < 5 V |
| HIGH | >15 V | >15 V | >15 V |
| Input current at rated voltage | Approx. 4 mA | Approx. 4 mA | Approx. 4 mA |
| Switching delay | Max. 2.0 ms | Max. 2.0 ms | Max. 2.0 ms |
| Modulation compared to ground potential | Max. ±38 V | Max. ±38 V | Max. ±38 V |
| **Enable input** | **8V1022.00-2, 8V1022.001-2** | **8V1045.00-2, 8V1045.001-2** | **8V1090.00-2, 8V1090.001-2** |
| Number of inputs | 1 | 1 | 1 |
| Wiring | Sink | Sink | Sink |
| Electrical isolation | | | |
| Input - ACOPOS | Yes | Yes | Yes |
| Input voltage | | | |
| Rated | 24 VDC | 24 VDC | 24 VDC |
| Maximum | 30 VDC | 30 VDC | 30 VDC |
| Switching threshold | | | |
| LOW | < 5 V | < 5 V | < 5 V |
| HIGH | >15 V | >15 V | >15 V |
| Input current at rated voltage | Approx. 30 mA | Approx. 30 mA | Approx. 30 mA |
| Switching delay | | | |
| Enable 1 -> 0, PWM off | Max. 2.0 ms | Max. 2.0 ms | Max. 2.0 ms |
| Enable 0 -> 1, ready for PWM | Max. 100 µs | Max. 100 µs | Max. 100 µs |
| Modulation compared to ground potential | Max. ±38 V | Max. ±38 V | Max. ±38 V |

# Servo drives
# 8V1022, 8V1045, 8V1090

| Operational conditions | 8V1022.00-2, 8V1022.001-2 | 8V1045.00-2, 8V1045.001-2 | 8V1090.00-2, 8V1090.001-2 |
|---|---|---|---|
| Ambient temperature during operation | 5 to 40°C | 5 to 40°C | 5 to 40°C |
| Max. ambient temperature [1] | +55°C | +55°C | +55°C |
| Relative humidity during operation | 5 to 85%, non-condensing | 5 to 85%, non-condensing | 5 to 85%, non-condensing |
| Installation at altitudes above sea level | 0 to 500 m | 0 to 500 m | 0 to 500 m |
| Maximum installation altitude [2] | 2000 m | 2000 m | 2000 m |
| Degree of pollution according to EN 60664-1 | 2 (non-conductive material) | 2 (non-conductive material) | 2 (non-conductive material) |
| Overvoltage cat. according to IEC 60364-4-443:1999 | II | II | II |
| EN 60529 protection | IP20 | IP20 | IP20 |

1) Continuous operation of ACOPOS servo drives at an ambient temperature ranging from 40°C to 55°C is possible (taking the continuous current reductions listed into consideration), but results in a shorter lifespan.

2) Continuous operation of ACOPOS servo drives at altitudes ranging from 500 m to 2000 m above sea level is possible (taking the continuous current reductions listed into consideration). Additional requirements are to be arranged with B&R.

| Storage and transport conditions | 8V1022.00-2, 8V1022.001-2 | 8V1045.00-2, 8V1045.001-2 | 8V1090.00-2, 8V1090.001-2 |
|---|---|---|---|
| Storage temperature | -25 to +55°C | -25 to +55°C | -25 to +55°C |
| Relative humidity during storage | 5 to 95%, non-condensing | 5 to 95%, non-condensing | 5 to 95%, non-condensing |
| Transport temperature | -25 to +70°C | -25 to +70°C | -25 to +70°C |
| Relative humidity during transport | 95% at +40°C | 95% at +40°C | 95% at +40°C |
| **Mechanical characteristics** | **8V1022.00-2, 8V1022.001-2** | **8V1045.00-2, 8V1045.001-2** | **8V1090.00-2, 8V1090.001-2** |
| Dimensions | | | |
| Width | 70.5 mm | 70.5 mm | 70.5 mm |
| Height | 375 mm | 375 mm | 375 mm |
| Depth | 235.5 mm | 235.5 mm | 235.5 mm |
| Weight | 4.0 kg | 4.1 kg | 4.4 kg |

| Optional accessories | | |
|---|---|---|
| 8AC110.60-2 | ACOPOS plug-in module, CAN interface | 1290 |
| 8AC114.60-2 | ACOPOS plug-in module, POWERLINK V2 interface | 1291 |
| 8AC120.60-1 | ACOPOS insert module, EnDat encoder and sine incremental encoder interface | 1292 |
| 8AC121.60-1 | ACOPOS plug-in module, HIPERFACE interface | 1294 |
| 8AC122.60-3 | ACOPOS plug-in module, resolver interface | 1296 |
| 8AC123.60-1 | ACOPOS plug-in module, incremental encoder and SSI absolute encoder interface | 1298 |
| 8AC130.60-1 | ACOPOS insert module, 8 digital I/O configurable in pairs as 24V input or as 400/100 mA output, 2 digital outputs 2A, order TB712 terminal blocks separately | 1300 |
| 8AC131.60-1 | ACOPOS plug-in module, 2 analog inputs ±10V, 2 digital I/O points which can be configured as a 24V input or as 45 mA output, order TB712 terminal blocks separately | 1303 |
| 8AC140.60-2 | ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately. | 1306 |
| 8AC140.60-3 | ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 32MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately. | 1306 |
| 8AC140.61-3 | ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately | 1306 |
| 8AC141.60-2 | ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input ±10V, order program memory and 0TB704 and 0TB708 terminal blocks separately. | 1310 |
| 8AC141.61-3 | ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input ±10V, order program memory and 0TB704 and 0TB708 terminal blocks separately. | 1310 |
| 0PS320.1 | 24 VDC power supply, 3-phase, 20 A, input 400..500 VAC (3 phases), wide range, DIN rail mounting | 659 |
| 8CM005.12-1 | Motor cable, length 5 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed | 1314 |
| 8CM007.12-1 | Motor cable, length 7 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed | 1314 |
| 8CM010.12-1 | Motor cable, length 10 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed | 1314 |
| 8CM015.12-1 | Motor cable, length 15 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed | 1314 |
| 8CM020.12-1 | Motor cable, length 20 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed | 1314 |
| 8CM025.12-1 | Motor cable, length 25 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed | 1314 |

# Servo drives
# 8V1180, 8V1320

8V1180.0xx-2

8V1320.0xx-2

- Modular mechanical structure using insert modules
- Integrated power filter
- Integrated or External braking resistor
- All connections made using plug-in connectors
- Integrated electronic restart inhibit

| General information | 8V1180.00-2, 8V1180.001-2 | 8V1320.00-2, 8V1320.001-2 |
|---|---|---|
| C-UL-US listed | Yes | Yes |
| **Power mains connection** | **8V1180.00-2, 8V1180.001-2** | **8V1320.00-2, 8V1320.001-2** |
| Mains input voltage | 3x 400 VAC to 480 VAC ±10%<br>Power filter according to EN 61800-3-A11 second environment<br>(Limits from CISPR11, Group 2, Class A) | 3x 400 VAC to 480 VAC ±10%<br>Power filter according to EN filter 61800-3-A11 second environment<br>(Limits from CISPR11, Group 2, Class A) |
| Frequency | 50 / 60 Hz ± 4% | 50 / 60 Hz ± 4% |
| Installed load | Max. 17 kVA | Max. 30 kVA |
| Starting current at 400 VAC | 13 A | 13 A |
| Switch-on interval | > 10 sec | > 10 sec |
| Power loss at max. device power without Braking resistor | Approx. 500 W | Approx. 800 W |
| **24 VDC supply** | **8V1180.00-2, 8V1180.001-2** | **8V1320.00-2, 8V1320.001-2** |
| Input voltage | 24 VDC +25% / -20% | 24 VDC +25% / -20% |
| Input capacitance | 40,000 µF | 40,000 µF |
| Current requirements at 24 VDC [1] | | |
| Mains input voltage applied | --- [2] | --- [2] |
| Mains input voltage not applied | Max. 2.8 A + current for motor holding brake + current on the 24 VDC output | Max. 2.8 A + current for motor holding brake + current on the 24 VDC output |
| DC bus power supply | | |
| Switch-on voltage | 455 VDC | 455 VDC |

1) The current requirements depend on the configuration of the ACOPOS servo drive.

2) If the mains input voltage (3x 400 VAC to 480 VAC ±10%) is applied, the 24 VDC supply voltage for the ACOPOS servo drive is created by the internal DC bus power supply, which reduces the 24 VDC current requirements ($I_{24\ VDC}$) to 0.

| 24 VDC output | 8V1180.00-2, 8V1180.001-2 | 8V1320.00-2, 8V1320.001-2 |
|---|---|---|
| Output voltage | | |
| Mains input voltage applied | 22 to 24 VDC | 22 to 24 VDC |
| Mains input voltage not applied | 16.7 to 30 VDC [1] | 16.7 to 30 VDC [1] |
| Output current | Max. 0.5 A | Max. 0.5 A |

1) If the mains input voltage (3x 400 VAC to 480 VAC ±10%) is not applied, the voltage is created at the 24 VDC output from the ACOPOS servo drive's 24 VDC supply voltage; in this case it is between the maximum allowable and the minimum allowable (reduced by max. 2.5 V) 24 VDC supply voltage of the ACOPOS servo drive.

| DC bus | 8V1180.00-2, 8V1180.001-2 | 8V1320.00-2, 8V1320.001-2 |
|---|---|---|
| DC bus capacitance | 940 µF | 1645 µF |
| **Motor connector** | **8V1180.00-2, 8V1180.001-2** | **8V1320.00-2, 8V1320.001-2** |
| Continuous current [1] | 19 $A_{eff}$ | 34 $A_{eff}$ |
| Reduction of continuous current depending on ambient temperature[2] | | |
| Mains input voltage: 400 VAC | | |
| Switching frequency 20 kHz | No reduction | 0.61 $A_{eff}$ per °C (from 40°C) |
| Switching frequency 10 kHz | **No reduction** | **No reduction** |
| Switching frequency 5 kHz | No reduction | No reduction |
| Mains input voltage: 480 VAC | | |
| Switching frequency 20 kHz | No reduction | 0.61 $A_{eff}$ per °C (from 25°C) |
| Switching frequency 10 kHz | **No reduction** | **No reduction** |
| Switching frequency 5 kHz | No reduction | No reduction |
| Reduction of continuous current depending on installation altitude | | |
| Starting at 500 m above sea level | 1.9 $A_{eff}$ per 1000 m | 3.4 $A_{eff}$ per 1000 m |
| Maximum current | 50 $A_{eff}$ | 80 $A_{eff}$ |
| Rated switching frequency | 10 kHz | 10 kHz |
| Maximum motor line length | 25 m | 25 m |
| Protective measures | Short circuit & overload protection | Short circuit & overload protection |

1) Valid in the following conditions: Mains input voltage 400 VAC, nominal switching frequency, 40°C ambient temperature, installation altitudes < 500 m above sea level.

2) The nominal switching frequency values for the respective ACOPOS servo drive are marked in bold.

| Motor holding brake connection | 8V1180.00-2, 8V1180.001-2 | 8V1320.00-2, 8V1320.001-2 |
|---|---|---|
| Maximum output current | 1.5 A | 1.5 A |
| Max. number of switching cycles | Unlimited since done electronically | Unlimited since done electronically |
| **Braking resistor** | **8V1180.00-2, 8V1180.001-2** | **8V1320.00-2, 8V1320.001-2** |
| Peak power int. / ext. | 14 / 40 kW | 14 / 40 kW |
| Continuous power int. / ext. | 0.4 / 8 kW [1] | 0.4 / 8 kW [1] |
| Minimum braking resistance (ext.) | 15 Ω | 15 Ω |
| Rated current of the built-in fuse | 10 A (fast-acting) | 10 A (fast-acting) |

1) Continuous power refers to the maximum breaking power the ACOPOS servo driver can yield continuously. Depending on the application, the actual continuous power provided by the external braking resistor is limited by the rated current of fuse $I_B$ (integrated in the ACOPOS servo driver), and the value of the external braking resistance $R_{BR}$.

| Trigger inputs | 8V1180.00-2, 8V1180.001-2 | 8V1320.00-2, 8V1320.001-2 |
|---|---|---|
| Number of inputs | 2 | 2 |
| Wiring | Sink | Sink |
| Electrical isolation | | |
| Input - ACOPOS | Yes | Yes |
| Input - Input | No | No |
| Input voltage | | |
| Rated | 24 VDC | 24 VDC |
| Maximum | 30 VDC | 30 VDC |
| Switching threshold | | |
| LOW | < 5 V | < 5 V |
| HIGH | >15 V | >15 V |
| Input current at rated voltage | Approx. 10 mA | Approx. 10 mA |
| Switching delay | | |
| Positive edge | 52 µs ± 0.5 µs (digitally filtered) | 52 µs ± 0.5 µs (digitally filtered) |
| Negative edge | 53 µs ± 0.5 µs (digitally filtered) | 53 µs ± 0.5 µs (digitally filtered) |
| Modulation compared to ground potential | Max. ±38 V | Max. ±38 V |
| **Limit switch and reference inputs** | **8V1180.00-2, 8V1180.001-2** | **8V1320.00-2, 8V1320.001-2** |
| Number of inputs | 3 | 3 |
| Wiring | Sink | Sink |
| Electrical isolation | | |
| Input - ACOPOS | Yes | Yes |
| Input - Input | No | No |
| Input voltage | | |
| Rated | 24 VDC | 24 VDC |
| Maximum | 30 VDC | 30 VDC |
| Switching threshold | | |
| LOW | < 5 V | < 5 V |
| HIGH | >15 V | >15 V |
| Input current at rated voltage | Approx. 4 mA | Approx. 4 mA |
| Switching delay | Max. 2.0 ms | Max. 2.0 ms |
| Modulation compared to ground potential | Max. ±38 V | Max. ±38 V |

| Enable input | 8V1180.00-2, 8V1180.001-2 | 8V1320.00-2, 8V1320.001-2 |
|---|---|---|
| Number of inputs | 1 | 1 |
| Wiring | Sink | Sink |
| Electrical isolation | | |
| Input - ACOPOS | Yes | Yes |
| Input voltage | | |
| Rated | 24 VDC | 24 VDC |
| Maximum | 30 VDC | 30 VDC |
| Switching threshold | | |
| LOW | < 5 V | < 5 V |
| HIGH | >15 V | >15 V |
| Input current at rated voltage | Approx. 30 mA | Approx. 30 mA |
| Switching delay | | |
| Enable 1 -> 0, PWM off | Max. 2.0 ms | Max. 2.0 ms |
| Enable 0 -> 1, ready for PWM | Max. 100 µs | Max. 100 µs |
| Modulation compared to ground potential | Max. ±38 V | Max. ±38 V |
| **Operational conditions** | **8V1180.00-2, 8V1180.001-2** | **8V1320.00-2, 8V1320.001-2** |
| Environment temperature during operation[1)] | 5 to 40°C | 5 to 40°C |
| Max. ambient temperature | +55°C | +55°C |
| Relative humidity during operation | 5 to 85%, non-condensing | 5 to 85%, non-condensing |
| Installation at altitudes above sea level | 0 to 500 m | 0 to 500 m |
| Maximum installation altitude [2)] | 2000 m | 2000 m |
| Degree of pollution according to EN 60664-1 | 2 (non-conductive material) | 2 (non-conductive material) |
| Overvoltage cat. according to IEC 60364-4-443:1999 | II | II |
| EN 60529 protection | IP20 | IP20 |

1) Continuous operation of ACOPOS servo drives at an ambient temperature ranging from 40°C to 55°C is possible (taking the continuous current reductions listed into consideration), but results in a shorter lifespan.

2) Continuous operation of ACOPOS servo drives at altitudes ranging from 500 m to 2000 m above sea level is possible (taking the continuous current reductions listed into consideration). Additional requirements are to be arranged with B&R.

| Storage and transport conditions | 8V1180.00-2, 8V1180.001-2 | 8V1320.00-2, 8V1320.001-2 |
|---|---|---|
| Storage temperature | -25 to +55°C | -25 to +55°C |
| Relative humidity during storage | 5 to 95%, non-condensing | 5 to 95%, non-condensing |
| Transport temperature | -25 to +70°C | -25 to +70°C |
| Relative humidity during transport | 95% at +40°C | 95% at +40°C |
| **Mechanical characteristics** | **8V1180.00-2, 8V1180.001-2** | **8V1320.00-2, 8V1320.001-2** |
| Dimensions | | |
| Width | 200 mm | 200 mm |
| Height | 375 mm | 375 mm |
| Depth | 234 mm | 234 mm |
| Weight | 10.1 kg | 10.6 kg |

| Optional accessories | | |
|---|---|---|
| 8AC110.60-2 | ACOPOS plug-in module, CAN interface | 1290 |
| 8AC114.60-2 | ACOPOS plug-in module, POWERLINK V2 interface | 1291 |
| 8AC120.60-1 | ACOPOS insert module, EnDat encoder and sine incremental encoder interface | 1292 |
| 8AC121.60-1 | ACOPOS plug-in module, HIPERFACE interface | 1294 |
| 8AC122.60-3 | ACOPOS plug-in module, resolver interface | 1296 |
| 8AC123.60-1 | ACOPOS plug-in module, incremental encoder and SSI absolute encoder interface | 1298 |
| 8AC130.60-1 | ACOPOS insert module, 8 digital I/O configurable in pairs as 24V input or as 400/100 mA output, 2 digital outputs 2A, order TB712 terminal blocks separately | 1300 |
| 8AC131.60-1 | ACOPOS plug-in module, 2 analog inputs ±10V, 2 digital I/O points which can be configured as a 24V input or as 45 mA output, order TB712 terminal blocks separately | 1303 |
| 8AC140.60-2 | ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Profibus-DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately | 1306 |
| 8AC140.60-3 | ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 32MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately. | 1306 |
| 8AC140.61-3 | ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately | 1306 |
| 8AC141.60-2 | ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input ±10V, order program memory and 0TB704 and 0TB708 terminal blocks separately. | 1310 |
| 8AC141.61-3 | ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input ±10V, order program memory and 0TB704 and 0TB708 terminal blocks separately. | 1310 |
| 0PS320.1 | 24 VDC power supply, 3-phase, 20 A, input 400..500 VAC (3 phases), wide range, DIN rail mounting | 659 |
| 8CM005.12-3 | Motor cable, length 5 m, 4 x 4 mm² + 2 x 2 x 1 mm², motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed | 1315 |
| 8CM007.12-3 | Motor cable, length 7 m, 4 x 4 mm² + 2 x 2 x 1 mm², motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed | 1315 |
| 8CM010.12-3 | Motor cable, length 10 m, 4 x 4 mm² + 2 x 2 x 1 mm², motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed | 1315 |
| 8CM015.12-3 | Motor cable, length 15 m, 4 x 4 mm² + 2 x 2 x 1 mm², motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed | 1315 |
| 8CM020.12-3 | Motor cable, length 20 m, 4 x 4 mm² + 2 x 2 x 1 mm², motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed | 1315 |
| 8CM025.12-3 | Motor cable, length 25 m, 4 x 4 mm² + 2 x 2 x 1 mm², motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed | 1315 |

# Servo drives
# 8V1640, 8V128M

8V1640.0xx-2

8V128M.0xx-2

- Modular mechanical structure using insert modules
- Integrated power filter
- Integrated or optional external braking resistor
- Integrated electronic restart inhibit

| **General information** | **8V1640.00-2, 8V1640.001-2** | **8V128M.00-2, 8V128M.001-2** |
|---|---|---|
| C-UL-US listed | Yes | Yes |
| **Power mains connection** | **8V1640.00-2, 8V1640.001-2** | **8V128M.00-2, 8V128M.001-2** |
| Mains input voltage | 3x 400 VAC to 480 VAC ±10%<br>Power filter according to IEC 61800-3-A11 second environment<br>(Limits from CISPR11, Group 2, Class A) | 3x 400 VAC to 480 VAC ±10%<br>Power filter according to IEC 61800-3-A11 second environment<br>(Limits from CISPR11, Group 2, Class A) |
| Frequency | 50 / 60 Hz ± 4% | 50 / 60 Hz ± 4% |
| Installed load | Max. 54 kVA | Max. 98 kVA |
| Starting current at 400 VAC | 26 A | 26 A |
| Switch-on interval | > 10 sec | > 10 sec |
| Power loss at max. device power without braking resistor | Approx. 1600 W | Approx. 3200 W |
| **24 VDC supply** | **8V1640.00-2, 8V1640.001-2** | **8V128M.00-2, 8V128M.001-2** |
| Input voltage | 24 VDC +25% / -20% | 24 VDC +25% / -20% |
| Input capacitance | 32800 µF | 32800 µF |
| Current requirements at 24 VDC [1] | | |
| Mains input voltage applied | --- [2] | --- [2] |
| Mains input voltage not applied | Max. 4.6 A + 1.4 * (current for motor holding brake + current on the 24 VDC output) | Max. 5.7 A + 1.4 * (current for the motor holding brake + current on the 24 VDC output) |
| DC bus power supply | | |
| Switch-on voltage | 455 VDC | 455 VDC |

1) The current requirements depend on the configuration of the ACOPOS servo drive.

2) If the mains input voltage (3x 400 VAC to 480 VAC ±10%) is applied, the 24 VDC supply voltage for the ACOPOS servo drive is created by the internal DC bus power supply, which reduces the 24 VDC current requirements ($I_{24\ VDC}$) to 0.

| **24 VDC output** | **8V1640.00-2, 8V1640.001-2** | **8V128M.00-2, 8V128M.001-2** |
|---|---|---|
| Output voltage | | |
| Mains input voltage applied | 22 to 24 VDC | 22 to 24 VDC |
| Mains input voltage not applied | 16.7 to 30 VDC [1] | 16.7 to 30 VDC [1] |
| Output current | Max. 0.5 A | Max. 0.5 A |

1) If the mains input voltage (3x 400 VAC to 480 VAC ±10%) is not applied, the voltage is created at the 24 VDC output from the ACOPOS servo drive's 24 VDC supply voltage; in this case it is between the maximum allowable and the minimum allowable (reduced by max. 2.5 V) 24 VDC supply voltage of the ACOPOS servo drive.

| **DC bus** | **8V1640.00-2, 8V1640.001-2** | **8V128M.00-2, 8V128M.001-2** |
|---|---|---|
| DC bus capacitance | 3300 µF | 6600 µF |
| **Motor connector** | **8V1640.00-2, 8V1640.001-2** | **8V128M.00-2, 8V128M.001-2** |
| Continuous current [1] | 64 $A_{eff}$ | 128 $A_{eff}$ |
| Reduction of continuous current depending on the ambient temperature [2] | | |
| Mains input voltage: 400 VAC | | |
| Switching frequency 20 kHz | 0.96 $A_{eff}$ per °C (from 25°C) | 1.65 $A_{eff}$ per °C (from 12°C) |
| Switching frequency 10 kHz | **No reduction** | 1.65 $A_{eff}$ per °C (from 52°C) |
| Switching frequency 5 kHz | No reduction | **No reduction** |
| Mains input voltage: 480 VAC | | |
| Switching frequency 20 kHz | 0.96 $A_{eff}$ per °C (from 10°C) | 1.65 $A_{eff}$ per °C (from 10°C) [3] |
| Switching frequency 10 kHz | **0.96 $A_{eff}$ per °C (from 50°C)** | 1.65 $A_{eff}$ per °C (from 36°C) |
| Switching frequency 5 kHz | No reduction | **No reduction** |
| Reduction of continuous current depending on installation altitude | | |
| Starting at 500 m above sea level | 6.4 $A_{eff}$ per 1000 m | 12.8 $A_{eff}$ per 1000 m |
| Maximum current | 200 $A_{eff}$ | 300 $A_{eff}$ |
| Rated switching frequency | 10 kHz | 5 kHz |
| Maximum motor line length | 25 m | 25 m |
| Protective measures | Short circuit and overload protection | Short circuit and overload protection |

1) Valid in the following conditions: Mains input voltage 400 VAC, nominal switching frequency, 40°C ambient temperature, installation altitudes < 500 m above sea level.

2) The nominal switching frequency values for the respective ACOPOS servo drive are marked in bold.

3) For a mains input voltage of 480 VAC and a switching frequency of 20 kHz, a maximum continuous current of 95 $A_{eff}$ is permitted. At ambient temperatures > 10°C, a reduction of the continuous current of 1.65 $A_{eff}$ per °C must be taken into consideration.

| Motor holding brake connection | 8V1640.00-2, 8V1640.001-2 | 8V128M.00-2, 8V128M.001-2 |
|---|---|---|
| Maximum output current | 3 A | 3 A |
| Max. number of switching cycles | Approx. 80,000 | Approx. 80,000 |
| **Braking resistor** | **8V1640.00-2, 8V1640.001-2** | **8V128M.00-2, 8V128M.001-2** |
| Peak power int. / ext. | 7 / 250 kW | 8.5 / 250 kW |
| Continuous power int. / ext. | 0.2 / 24 kW [1] | 0.24 / 24 kW [1] |
| Minimum braking resistance (ext.) | 2.5 Ω | 2.5 Ω |
| Rated current of the built-in fuse | 30 A (fast-acting) | 30 A (fast-acting) |

1) Continuous power refers to the maximum breaking power the ACOPOS servo driver can yield continuously. Depending on the application, the actual continuous power provided by the external braking resistor is limited by the rated current of fuse $I_B$ (integrated in the ACOPOS servo driver), and the value of the external braking resistance $R_{BR}$.

| Trigger inputs | 8V1640.00-2, 8V1640.001-2 | 8V128M.00-2, 8V128M.001-2 |
|---|---|---|
| Number of inputs | 2 | 2 |
| Wiring | Sink | Sink |
| Electrical isolation | | |
| Input - ACOPOS | Yes | Yes |
| Input - Input | No | No |
| Input voltage | | |
| Rated | 24 VDC | 24 VDC |
| Maximum | 30 VDC | 30 VDC |
| Switching threshold | | |
| LOW | < 5 V | < 5 V |
| HIGH | >15 V | >15 V |
| Input current at rated voltage | Approx. 10 mA | Approx. 10 mA |
| Switching delay | | |
| Positive edge | 52 µs ± 0.5 µs (digitally filtered) | 52 µs ± 0.5 µs (digitally filtered) |
| Negative edge | 53 µs ± 0.5 µs (digitally filtered) | 53 µs ± 0.5 µs (digitally filtered) |
| Modulation compared to ground potential | Max. ±38 V | Max. ±38 V |

| Limit switch and reference inputs | 8V1640.00-2, 8V1640.001-2 | 8V128M.00-2, 8V128M.001-2 |
|---|---|---|
| Number of inputs | 3 | 3 |
| Wiring | Sink | Sink |
| Electrical isolation | | |
| Input - ACOPOS | Yes | Yes |
| Input - Input | No | No |
| Input voltage | | |
| Rated | 24 VDC | 24 VDC |
| Maximum | 30 VDC | 30 VDC |
| Switching threshold | | |
| LOW | < 5 V | < 5 V |
| HIGH | >15 V | >15 V |
| Input current at rated voltage | Approx. 4 mA | Approx. 4 mA |
| Switching delay | Max. 2.0 ms | Max. 2.0 ms |
| Modulation compared to ground potential | Max. ±38 V | Max. ±38 V |

| Enable input | 8V1640.00-2, 8V1640.001-2 | 8V128M.00-2, 8V128M.001-2 |
|---|---|---|
| Number of inputs | 1 | 1 |
| Wiring | Sink | Sink |
| Electrical isolation | | |
| Input - ACOPOS | Yes | Yes |
| Input voltage | | |
| Rated | 24 VDC | 24 VDC |
| Maximum | 30 VDC | 30 VDC |
| Switching threshold | | |
| LOW | < 5 V | < 5 V |
| HIGH | >15 V | >15 V |
| Input current at rated voltage | Approx. 30 mA | Approx. 30 mA |
| Switching delay | | |
| Enable 1 -> 0, PWM off | Max. 2.0 ms | Max. 2.0 ms |
| Enable 0 -> 1, ready for PWM | Max. 100 µs | Max. 100 µs |
| Modulation compared to ground potential | Max. ±38 V | Max. ±38 V |
| **Operational conditions** | **8V1640.00-2, 8V1640.001-2** | **8V128M.00-2, 8V128M.001-2** |
| Ambient temperature during operation | 5 to 40°C | 5 to 40°C |
| Max. ambient temperature [1] | +55°C | +55°C |
| Relative humidity during operation | 5 to 85%, non-condensing | 5 to 85%, non-condensing |
| Installation at altitudes above sea level | 0 to 500 m | 0 to 500 m |
| Maximum installation altitude [2] | 2000 m | 2000 m |
| Degree of pollution according to EN 60664-1 | 2 (non-conductive material) | 2 (non-conductive material) |
| Overvoltage cat. according to IEC 60364-4-443:1999 | II | II |
| EN 60529 protection | IP20 | IP20 |

1) Continuous operation of ACOPOS servo drives at an ambient temperature ranging from 40°C to 55°C is possible (taking the continuous current reductions listed into consideration), but results in a shorter lifespan.

2) Continuous operation of ACOPOS servo drives at altitudes ranging from 500 m to 2000 m above sea level is possible (taking the continuous current reductions listed into consideration). Additional requirements are to be arranged with B&R.

| Storage and transport conditions | 8V1640.00-2, 8V1640.001-2 | 8V128M.00-2, 8V128M.001-2 |
|---|---|---|
| Storage temperature | -25 to +55°C | -25 to +55°C |
| Relative humidity during storage | 5 to 95%, non-condensing | 5 to 95%, non-condensing |
| Transport temperature | -25 to +70°C | -25 to +70°C |
| Relative humidity during transport | 95% at +40°C | 95% at +40°C |
| **Mechanical characteristics** | **8V1640.00-2, 8V1640.001-2** | **8V128M.00-2, 8V128M.001-2** |
| Dimensions | | |
| Width | 276 mm | 402 mm |
| Height | 460 mm | 460 mm |
| Depth | 295 mm | 295 mm |
| Weight | 24.1 kg | 33.8 kg |

| Optional accessories | | |
|---|---|---|
| 8AC110.60-2 | ACOPOS plug-in module, CAN interface | 1290 |
| 8AC114.60-2 | ACOPOS plug-in module, POWERLINK V2 interface | 1291 |
| 8AC120.60-1 | ACOPOS insert module, EnDat encoder and sine incremental encoder interface | 1292 |
| 8AC121.60-1 | ACOPOS plug-in module, HIPERFACE interface | 1294 |
| 8AC122.60-3 | ACOPOS plug-in module, resolver interface | 1296 |
| 8AC123.60-1 | ACOPOS plug-in module, incremental encoder and SSI absolute encoder interface | 1298 |
| 8AC130.60-1 | ACOPOS insert module, 8 digital I/O configurable in pairs as 24V input or as 400/100 mA output, 2 digital outputs 2A, order TB712 terminal blocks separately. | 1300 |
| 8AC131.60-1 | ACOPOS plug-in module, 2 analog inputs ±10V, 2 digital I/O points which can be configured as a 24V input or as 45 mA output, order TB712 terminal blocks separately | 1303 |
| 8AC140.60-2 | ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Profibus-DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately | 1306 |
| 8AC140.60-3 | ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 32MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately. | 1306 |
| 8AC140.61-3 | ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately | 1306 |
| 8AC141.60-2 | ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input ±10V, order program memory and 0TB704 and 0TB708 terminal blocks separately. | 1310 |
| 8AC141.61-3 | ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input ±10V, order program memory and 0TB704 and 0TB708 terminal blocks separately. | 1310 |
| 0PS320.1 | 24 VDC power supply, 3-phase, 20 A, input 400..500 VAC (3 phases), wide range, DIN rail mounting | 659 |
| 8CM005.12-5 | Motor cable, length 5 m, 4 x 10 mm² + 2 x 2 x 1.5 mm², motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified | 1316 |
| 8CM007.12-5 | Motor cable, length 7 m, 4 x 10 mm² + 2 x 2 x 1.5 mm², motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified | 1316 |
| 8CM010.12-5 | Motor cable, length 10 m, 4 x 10 mm² + 2 x 2 x 1.5 mm², motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified | 1316 |
| 8CM015.12-5 | Motor cable, length 15 m, 4 x 10 mm² + 2 x 2 x 1.5 mm², motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified | 1316 |
| 8CM020.12-5 | Motor cable, length 20 m, 4 x 10 mm² + 2 x 2 x 1.5 mm², motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified | 1316 |
| 8CM025.12-5 | Motor cable, length 25 m, 4 x 10 mm² + 2 x 2 x 1.5 mm², motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified | 1316 |

# CAN bus interface
# 8AC110

- CAN interface for installation in ACOPOS servo drives
- For communication and configuration of the ACOPOS servo drives for standard applications
- Node number can be set using switch

| General information | 8AC110.60-2 |
|---|---|
| C-UL-US listed | Yes |
| Module type | ACOPOS plug-in module |
| Slot | Slot 1 |
| Power consumption | Max. 0.7 W |
| **CAN bus interface** | **8AC110.60-2** |
| Connection, module-side | 9-pin DSUB plug |
| Indicators | RXD/TXD LEDs |
| Electrical isolation | |
| CAN bus - ACOPOS | Yes |
| Maximum distance | 60 m |
| Baud rate | 500 kBit/s |
| Network-capable | Yes |
| Bus termination resistor | Externally wired |
| **Operational conditions** | **8AC110.60-2** |
| Ambient temperature during operation | --- 1) |
| Relative humidity during operation | --- 1) |
| **Storage and transport conditions** | **8AC110.60-2** |
| Storage temperature | -25 to +55°C |
| Relative humidity during storage | 5 to 95%, non-condensing |
| Transport temperature | -25 to +70°C |
| Relative humidity during transport | 95% at +40°C |

1) ACOPOS plug-in modules can be used in an ACOPOS servo drive; the corresponding values can be found in the technical data of the respective ACOPOS servo drive.

CAN

| Optional accessories | | |
|---|---|---|
| 7AC911.9 | Bus connector, CAN | 1724 |
| 0AC912.9 | Bus adapter, CAN, 1 CAN bus interface | 1726 |
| 0AC913.92 | Bus adapter, CAN, 2 CAN bus interfaces, including 30 cm connection cable (DSUB connector) | 1726 |

# POWERLINK V2 interface
# 8AC114

- POWERLINK V2 interface for installation in ACOPOS servo drives
- Integrated 2x hub for easy wiring
- For communication and configuration of ACOPOS servo drives for complex and time-critical applications
- Node number can be set using switch

ETHERNET POWERLINK

| General information | 8AC114.60-2 |
|---|---|
| C-UL-US listed | In preparation |
| Module type | ACOPOS plug-in module |
| Slot | Slot 1 |
| Power consumption | Max. 3 W |
| **POWERLINK interface** | **8AC114.60-2** |
| Connection, module-side | 2x RJ45 socket |
| Indicators | Status LED + 2x Link LED |
| Electrical isolation | |
| ETHERNET - ACOPOS | Yes |
| Maximum distance per segment | 100 m [1] |
| Baud rate | 100 Mbit/s |
| Network-capable | Yes |
| Hub, 2x | Yes |
| Maximum number of hub levels | 10 |
| Cabling topology | Star or tree with level 2 hubs |
| Possible station operating modes | Synchronous to POWERLINK cycle |
| Watchdog function | |
| Hardware | Yes (via ACOPOS servo drive) |
| Software | Yes (via ACOPOS servo drive) |

1) With a cycle time of 400 µs and 10 ACOPOS servo drives, the maximum total cable length is 200 m.

| Operational conditions | 8AC114.60-2 |
|---|---|
| Ambient temperature during operation | --- [1] |
| Relative humidity during operation | --- [1] |

1) ACOPOS plug-in modules can be used in an ACOPOS servo drive; the corresponding values can be found in the technical data of the respective ACOPOS servo drive.

| Storage and transport conditions | 8AC114.60-2 |
|---|---|
| Storage temperature | -25 to +55°C |
| Relative humidity during storage | 5 to 95%, non-condensing |
| Transport temperature | -25 to +70°C |
| Relative humidity during transport | 95% at +40°C |

| Optional accessories | Amount | | |
|---|---|---|---|
| X20CA0E61.xxxx | max. 2 | EPL connection cable RJ45 to RJ45, xxxx m | 1728 |

# EnDat encoder and sine incremental encoder interface 8AC120

- EnDat encoder interface for installation in ACOPOS servo drives
- Encoder monitoring
- Also suitable for evaluating simple incremental encoders with sinusoidal input signal

| General information | 8AC120.60-1 |
|---|---|
| C-UL-US listed | Yes |
| Module type | ACOPOS plug-in module |
| Slot [1] | Slots 2, 3 and 4 |
| Power consumption | Depends on the encoder connected |
| E0 ... EnDat single-turn, 512 lines | Max. 2.3 W |
| E1 ... EnDat multi-turn, 512 lines | Max. 3.1 W |
| E2 ... EnDat single-turn, 32 lines (inductive) | Max. 3.1 W |
| E3 ... EnDat multi-turn, 32 lines (inductive) | Max. 3.1 W |
| E4 ... EnDat single-turn, 512 lines | Max. 2.4 W |
| E5 ... EnDat multi-turn, 512 lines | Max. 2.7 W |

1) The AC120 is an encoder module. Several encoder modules can also be inserted. In this case, the encoder module in the slot with the lowest number is automatically used for motor feedback.

| Encoder input [1] | 8AC120.60-1 |
|---|---|
| Connection, module-side | 15-pin DSUB socket |
| Indicators | UP/DN LEDs |
| Electrical isolation | |
| Encoder - ACOPOS | No |
| Encoder monitoring | Yes |
| Encoder supply | |
| Output voltage | Typ. 5 V |
| Ability to work under pressure | 250 mA [2] |
| Sense lines | 2, compensation of max. 2x 0.7 V |
| Sine-cosine inputs | |
| Signal transfer | Differential signals, symmetric |
| Differential voltage | 0.5 to 1.25 $V_{ss}$ |
| Common mode voltage | Max. ±7 V |
| Terminating resistor | 120 Ω |
| Signal frequency (-5 dB) | DC up to 400 kHz |
| Signal frequency (-3 dB) | DC up to 300 kHz |
| Resolution [3] | 16384 * number of encoder lines |
| Precision [4] | --- |
| Reference input | |
| Signal transfer | Differential signal, symmetric |
| Differential voltage for high | ≥ +0.2 V |
| Differential voltage for low | ≤ -0.2 V |
| Common mode voltage | Max. ±7 V |
| Terminating resistor | 120 Ω |
| Serial interface | Synchronous |
| Signal transfer | RS485 |
| Baud rate | 625 kBaud |

1) The EnDat encoder must be wired using a cable with a single shield.

2) This value only applies to the encoder. The actual load capacity of the encoder supply is approx. 300 mA. The difference of approx. 50 mA is covers the consumption of the terminating resistors that are always present. For longer encoder cables, it is important to note that the maximum voltage drop permitted on the supply wires (there and back) is 1.45 V. This can reduce the permissible load current.

3) Depending on the resolution of the connected encoder, in practical applications only a part of this resolution can be used. The usable resolution can be further reduced by signal interferences from the connected encoder.

4) In the field, the precision is limited by the encoder.

| Operational conditions | 8AC120.60-1 |
|---|---|
| Ambient temperature during operation | --- [1] |
| Relative humidity during operation | --- [1] |

1) ACOPOS plug-in modules can be used in an ACOPOS servo drive; the corresponding values can be found in the technical data of the respective ACOPOS servo drive.

| Storage and transport conditions | 8AC120.60-1 |
|---|---|
| Storage temperature | -25 to +55°C |
| Relative humidity during storage | 5 to 95%, non-condensing |
| Transport temperature | -25 to +70°C |
| Relative humidity during transport | 95% at +40°C |

| Optional accessories | | |
|---|---|---|
| 8CE005.12-1 | EnDat cable, length 5 m, 10 x 0.14 mm² + 2 x 0.5 mm², EnDat plug 17-pin Intercontec socket, 15-pin servo connector DSUB plug, can be used in cable drag chains, UL/CSA listed | 1318 |
| 8CE007.12-1 | EnDat cable, length 7 m, 10 x 0.14 mm² + 2 x 0.5 mm², EnDat plug 17-pin Intercontec socket, 15-pin servo connector DSUB plug, can be used in cable drag chains, UL/CSA listed | 1318 |
| 8CE010.12-1 | EnDat cable, length 10 m, 10 x 0.14 mm² + 2 x 0.5 mm², EnDat plug 17-pin Intercontec socket, 15-pin servo connector DSUB plug, can be used in cable drag chains, UL/CSA listed | 1318 |
| 8CE015.12-1 | EnDat cable, length 15 m, 10 x 0.14 mm² + 2 x 0.5 mm², EnDat plug 17-pin Intercontec socket, 15-pin servo connector DSUB plug, can be used in cable drag chains, UL/CSA listed | 1318 |
| 8CE020.12-1 | EnDat cable, length 20 m, 10 x 0.14 mm² + 2 x 0.5 mm², EnDat plug 17-pin Intercontec socket, 15-pin servo connector DSUB plug, can be used in cable drag chains, UL/CSA listed | 1318 |
| 8CE025.12-1 | EnDat cable, length 25 m, 10 x 0.14 mm² + 2 x 0.5 mm², EnDat plug 17-pin Intercontec socket, 15-pin servo connector DSUB plug, can be used in cable drag chains, UL/CSA listed | 1318 |

# HIPERFACE interface
# 8AC121

- HIPERFACE interface for installation in ACOPOS servo drives
- Encoder monitoring

| General information | 8AC121.60-1 |
|---|---|
| C-UL-US listed | Yes |
| Module type | ACOPOS plug-in module |
| Slot [1] | Slots 2, 3 and 4 |
| Power consumption | |
| With encoder current requirement of 0 mA | 0.35 W |
| With encoder current requirement of 100 mA | 1.4 W |
| With encoder current requirement of 170 mA | 2.1 W |

1) The AC121 is an encoder module. Several encoder modules can also be inserted. In this case, the module in the slot with the lowest number is automatically used for motor feedback.

| Encoder input [1] | 8AC121.60-1 |
|---|---|
| Connection, module-side | 15-pin DSUB socket, 2 pins closed |
| Indicators | UP/DN LEDs |
| Electrical isolation | |
| Encoder - ACOPOS | No |
| Encoder monitoring | Yes |
| Encoder supply | |
| Output voltage | 8 - 9 V |
| Ability to work under pressure | 170 mA |
| Sense lines | --- [2] |
| Sine-cosine inputs | |
| Signal transfer | Differential signal, asymmetric |
| Differential voltage | 0.5 ... 1.25 Vss |
| Common mode voltage | Max. ±7 V |
| Terminating resistor | 120 Ω |
| Signal frequency | DC ... 200 kHz |
| Resolution [3] | 16384 * number of encoder lines |
| Precision [4] | --- |
| Serial interface | Asynchronous |
| Signal transfer | RS485 |
| Baud rate | 9600 baud |

1) The HIPERFACE encoder must be wired using a cable with a single shield.

2) No sense lines are present because the supply voltage for the HIPERFACE encoder is permitted to lie between 7 and 12 V.

3) Noise on the encoder signal reduces the practical resolution by approx. 5 bits (a factor of 32).

4) In the field, the precision is limited by the encoder.

| Operational conditions | 8AC121.60-1 |
|---|---|
| Ambient temperature during operation | 0 to +50°C |
| Relative humidity during operation | 5 to 95%, non-condensing |
| **Storage and transport conditions** | **8AC121.60-1** |
| Storage temperature | -25 to +55°C |
| Relative humidity during storage | 5 to 95%, non-condensing |
| Transport temperature | -25 to +70°C |
| Relative humidity during transport | 95% at +40°C |

# Resolver interface
# 8AC122

- Resolver interface for installation in ACOPOS servo drives
- Monitoring the encoder input signals
- Resolver type BRX

| General information | 8AC122.60-3 |
|---|---|
| C-UL-US listed | Yes |
| Module type | ACOPOS plug-in module |
| Slot [1] | Slots 2, 3 and 4 |
| Power consumption | Max. 2.5 W |

1) The AC122 is an encoder module. Several encoder modules can also be inserted. In this case, the encoder module in the slot with the lowest number is automatically used for motor feedback.

| Resolver input [1] | 8AC122.60-3 |
|---|---|
| Resolver type | BRX [2] |
| Number of poles | 2-pin |
| Rated voltage ratio | 0.5 ± 10% |
| Input frequency | 10 kHz |
| Input voltage | 3 to 7 $V_{rms}$ |
| Max. phase shift | ± 45° |
| Max. elec. angular error | ± 10 angular minutes |
| Connection, module-side | 9-pin DSUB socket |
| Indicators | UP/DN LEDs |
| Electrical isolation | |
| Resolver - ACOPOS | No |
| Encoder monitoring | Yes |
| Resolution | 14 bits/rev [4] |
| Bandwidth | 2.5 kHz |
| Accuracy | ± 8 angular minutes |
| Reference output | |
| Signal transfer | Differential signals |
| Differential voltage | Typically 3.4 $V_{eff}$ |
| Output current | Max. 50 $mA_{eff}$ |
| Frequency | 10 kHz |
| Sine-cosine inputs | |
| Signal transfer | Differential signals |
| Input impedance at 10 kHz (per pin) | 10.4 kΩ - j 11.1 kΩ |
| Electrical isolation encoder-ACOPOS | No, common-mode voltage on the sine cosine inputs max ± 20 V |

1) The resolver must be wired using a cable with a single shield and twisted pair signal lines.

2) BRX resolvers are fed with a sine signal (reference signal) from the module and return two sine signals with a 90° phase shift as a result. The amplitudes of these signals change with the angular position of the resolver. Unlike BRX resolvers, BRT resolvers can be fed with two sine signals which are offset by 90°. A single sine signal with constant amplitude is returned. The phase position of this signal changes with the angular position of the resolver.
Starting with firmware V2.040, BRT resolvers can be basically evaluated with 8AC122.60-3. However, resolution and precision are limited because the resolver is run in inverse mode. Additionally, the rated voltage ratio is different to 0.5 (default value) and has to be set appropriately.

3) Starting with firmware V2.040, the rated voltage ratio can be set in a range of 0.3 ... 0.5 (default value).

4) 12 bits/rev is set as default, but this can be changed to 14 bits/rev.

| Operational conditions | 8AC122.60-3 |
|---|---|
| Ambient temperature during operation | --- [1] |
| Relative humidity during operation | --- [1] |

1) ACOPOS plug-in modules can be used in an ACOPOS servo drive; the corresponding values can be found in the technical data of the respective ACOPOS servo drives.

| Storage and transport conditions | 8AC122.60-3 |
|---|---|
| Storage temperature | -25 to +55°C |
| Relative humidity during storage | 5 to 95%, non-condensing |
| Transport temperature | -25 to +70°C |
| Relative humidity during transport | 95% at +40°C |

| Optional accessories | | |
|---|---|---|
| 8CR005.12-1 | Resolver cable, length 5 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed | 1319 |
| 8CR007.12-1 | Resolver cable, length 7 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed | 1319 |
| 8CR010.12-1 | Resolver cable, length 10 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed | 1319 |
| 8CR015.12-1 | Resolver cable, length 15 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed | 1319 |
| 8CR020.12-1 | Resolver cable, length 20 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed | 1319 |
| 8CR025.12-1 | Resolver cable, length 25 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed | 1319 |

# Incremental encoder and SSI absolute value encoder interface 8AC123

- Incremental encoder and SSI absolute encoder interface for installing ACOPOS servo drives
- Monitoring the encoder input signals
- Encoder supply voltage of 5V or 15V
- Compensation for a voltage drop at 5 V encoder supply voltage

| General information | 8AC123.60-1 |
|---|---|
| C-UL-US listed | Yes |
| Module type | ACOPOS plug-in module |
| Slot [1] | Slots 2, 3 and 4 |
| Power consumption | Max. 7.5 W |
| | Depends on the current requirements for the encoder connected [2] |

1) The AC123 is an encoder module. Several encoder modules can also be inserted. In this case, the encoder module in the slot with the lowest number is automatically used for motor feedback.

2) The power consumption of the plug-in module can be approximated using the following formula:

$P_{Module}$ [W] = $P_{Encoder}$ [W] . k + 0.6 W

The power consumed by the encoder $P_{Encoder}$ is calculated from the selected encoder supply voltage (5 V / 15 V) and the current required:

$P_{Encoder}$ [W] = $U_{Encoder}$ [V] . $I_{Encoder}$ [A]

The following values must be used for k:

k = 1.2 (for 15 V encoder supply)

k = 1.75 (for 5 V encoder supply)

| Encoder input [1] | 8AC123.60-1 |
|---|---|
| Connection, module-side | 15-pin DSUB socket |
| Indicators | UP/DN LEDs |
| Electrical isolation | |
| Encoder - ACOPOS | Yes |
| Encoder monitoring | Yes |
| Signal transfer | Differential signal transfer |
| Cable length [2] | Max. 50 m |

1) The encoder must be wired using a cable with a single shield and twisted pair signal lines (e.g. 4 x 2 x 0.14 mm² + 2 x 0.5 mm²).

2) A cable with at least 4 x 2 x 0.14 mm² + 2 x 0.5 mm² is required for the maximum cable length. The sense lines must be used.

| Encoder supply | 8AC123.60-1 |
|---|---|
| Supply voltages | Internal, select between 5 V/15 V |
| Sense lines | |
| For 5 V | Yes, 2, compensation of max. 2 V |
| For 15 V | No |
| Ability to work under pressure | |
| 5 V | 350 mA |
| 15 V | 350 mA |
| Short circuit protection, overload protection | Yes |

| Incremental encoder | 8AC123.60-1 |
|---|---|
| Signal form | Square wave pulse |
| Evaluation | 4x |
| Input frequency | Max. 200 kHz |
| Counter frequency | Max. 800 kHz |
| Reference frequency | Max. 200 kHz |
| Distance between edges | Min. 0.6 µs |
| Counter size | 32-bit |
| Inputs | A, A\, B, B\, R, R\ |
| Differential voltage inputs A, B, R | |
| Minimum | 2.5 V |
| Maximum | 6 V |

| SSI absolute encoder | 8AC123.60-1 |
|---|---|
| Coding | Gray, binary |
| Baud rate | 200 kBit/s |
| Word size | Max. 31-bit |
| Differential voltage clock output - 120 Ω | |
| Minimum | 2.5 V |
| Maximum | 5 V |
| Differential voltage data input | |
| Minimum | 2.5 V |
| Maximum | 6 V |
| **Operational conditions** | **8AC123.60-1** |
| Ambient temperature during operation | --- [1] |
| Relative humidity during operation | --- [1] |

1) ACOPOS plug-in modules can be used in an ACOPOS servo drive; the corresponding values can be found in the technical data of the respective ACOPOS servo drive.

| Storage and transport conditions | 8AC123.60-1 |
|---|---|
| Storage temperature | -25 to +55°C |
| Relative humidity during storage | 5 to 95%, non-condensing |
| Transport temperature | -25 to +70°C |
| Relative humidity during transport | 95% at +40°C |

# Digital mixed module
# 8AC130

- Digital mixed module for installation in ACOPOS servo drives
- Maximum of 8 digital inputs or 10 digital outputs
- The I/O points can be configured in pairs as inputs or outputs
- Incremental encoder functionality (A, B, R)
- Incremental encoder emulation

| General information | 8AC130.60-1 |
|---|---|
| C-UL-US listed | Yes |
| Module type | ACOPOS plug-in module |
| Slot [1] | Slots 2, 3 and 4 |
| Power consumption | Max. 0.8 W |

1) The AC130 can also be used as an encoder module. Several encoder modules can also be inserted. In this case, the encoder module in the slot with the lowest number is automatically used for motor feedback.

| Inputs/outputs | 8AC130.60-1 |
|---|---|
| Connection, module-side | 12-pin connector |
| Configuration of the inputs/outputs | Configured in pairs as input or output |
| Display | 24 V LED |

| Supply voltage | 8AC130.60-1 |
|---|---|
| Supply voltage | |
| Minimum | 18 VDC |
| Rated | 24 VDC |
| Maximum | 30 VDC |
| Reverse polarity protection | Yes |
| Voltage monitoring (24 V - LED) | Yes, supply voltage > 18 V |

| Digital inputs [1] | 8AC130.60-1 |
|---|---|
| Number of inputs | Max. 8 |
| Wiring | Sink |
| Electrical isolation | |
| Input - ACOPOS | Yes |
| Input - Input | No |
| Input voltage | |
| Rated | 24 VDC |
| Maximum | 30 VDC |
| Switching threshold | |
| LOW | < 5 V |
| HIGH | >15 V |
| Input current at rated voltage | |
| Inputs 1 - 4 | Approx. 10 mA |
| Inputs 5 - 8 | Approx. 5.5 mA |
| Switching delay | |
| Inputs 1 - 4 | Max. 5 µs |
| Inputs 5 - 8 | Max. 35 µs |
| Modulation compared to ground potential | --- |

1) Shielded cables must be used for inputs 1 - 4.

| Event counter | 8AC130.60-1 |
|---|---|
| Signal form | Square wave pulse |
| Input frequency | Max. 100 kHz |
| Counter size | 16-bit |
| Inputs | |
| Input 1 | Counter 1 |
| Input 2 | Counter 2 |

| Incremental encoder | 8AC130.60-1 |
|---|---|
| Signal form | Square wave pulse |
| Evaluation | 4x |
| Encoder monitoring | No |
| Input frequency | Max. 62.5 kHz |
| Counter frequency | Max. 250 kHz |
| Reference frequency | Max. 62.5 kHz |
| Distance between edges | Min. 2.5 µs |
| Counter size | 16-bit |
| Inputs | |
| Input 1 | Channel A |
| Input 2 | Channel B |
| Input 3 | Reference pulse R |
| **Outputs** | **8AC130.60-1** |
| Number of outputs | Max. 10 |
| Type | Transistor outputs |
| Outputs 1 - 4 | Push-pull |
| Outputs 5 - 10 | High-side |
| Electrical isolation | |
| Output - ACOPOS | Yes |
| Output - Output | No |
| Switching voltage | |
| Minimum | 18 VDC |
| Rated | 24 VDC |
| Maximum | 30 VDC |
| Continuous current | |
| Outputs 1 - 4 | Max. 100 mA |
| Outputs 5 - 8 | Max. 400 mA |
| Outputs 9 - 10 | Max. 2 A |
| Switching delay 0 -> 1 and 1 -> 0 | |
| Outputs 1 - 4 | Max. 5 µs |
| Outputs 5 - 8 | Max. 50 µs |
| Outputs 9 - 10 | Max. 500 µs |
| Switching frequency (resistive load) | |
| Outputs 1 - 2 | Max. 10 kHz |
| Outputs 3 - 4 | Max. 10 kHz |
| Outputs 5 - 8 | Max. 5 kHz |
| Outputs 9 - 10 | Max. 100 Hz |
| Protection | |
| Short circuit protection | Yes |
| Overload protection | Yes |
| Short circuit current at 24 V (until cut-off) | |
| Outputs 1 - 4 | Approx. 1 A |
| Outputs 5 - 8 | Approx. 1.2 A |
| Outputs 9 - 10 | Approx. 24 A |
| Readable outputs | Yes |

# Digital mixed module
# 8AC130

| Operational conditions | 8AC130.60-1 |
|---|---|
| Ambient temperature during operation | --- [1] |
| Relative humidity during operation | --- [1] |

1) ACOPOS plug-in modules can be used in an ACOPOS servo drive; the corresponding values can be found in the technical data of the respective ACOPOS servo drive.

| Storage and transport conditions | 8AC130.60-1 |
|---|---|
| Storage temperature | -25 to +55°C |
| Relative humidity during storage | 5 to 95%, non-condensing |
| Transport temperature | -25 to +70°C |
| Relative humidity during transport | 95% at +40°C |

| Required accessories | | |
|---|---|---|
| 7TB712.9 | Terminal block, 12-pin, screw clamps | 1721 |
| 7TB712.91 | Terminal block, 12-pin, cage clamps | 1721 |

# Mixed module 8AC131

- Mixed module for installation in ACOPOS servo drives
- 2 analog inputs with 12-bit resolution and up to 2 digital inputs/outputs
- Digital inputs/outputs can be switched individually
- Counter function
- All digital outputs can be read

| **General information** | **8AC131.60-1** |
|---|---|
| C-UL-US listed | Yes |
| Module type | ACOPOS plug-in module |
| Slot | Slots 2, 3 and 4 |
| Power consumption | Max. 1 W |
| **Inputs/outputs** | **8AC131.60-1** |
| Connection, module-side | 12-pin connector |
| Configuration of the digital inputs/outputs | Can be configured individually as digital input or output |
| Display | 24 V LED |
| **Supply voltage** | **8AC131.60-1** |
| Supply voltage | |
| Minimum | 18 VDC |
| Rated | 24 VDC |
| Maximum | 30 VDC |
| Reverse polarity protection | Yes |
| Voltage monitoring (24 V - LED) | Yes, supply voltage > 18 V |
| **Digital inputs** | **8AC131.60-1** |
| Number of inputs | Max. 2 |
| Wiring | Sink |
| Electrical isolation | |
| Input - ACOPOS | Yes |
| Input - Input | No |
| Input voltage | |
| Rated | 24 VDC |
| Maximum | 30 VDC |
| Switching threshold | |
| LOW | < 5 V |
| HIGH | >15 V |
| Input current at rated voltage | Approx. 8 mA |
| Switching delay | |
| Counter | Max. 5 µs |
| Digital input | Max. 55 µs (digitally filtered) |
| Modulation compared to ground potential | Max. ±50 V |
| **Event counter** | **8AC131.60-1** |
| Signal form | Square wave pulse |
| Input frequency | Max. 100 kHz |
| Counter size | 16-bit |
| Inputs | |
| Input 1 | Counter 1 |
| Input 2 | Counter 2 |

# Mixed module
# 8AC131

| Digital outputs | 8AC131.60-1 |
|---|---|
| Number of outputs | Max. 2 |
| Type | Transistor outputs push-pull |
| Electrical isolation | |
| Output - ACOPOS | Yes |
| Output - Output | No |
| Switching voltage | |
| Minimum | 18 VDC |
| Rated | 24 VDC |
| Maximum | 30 VDC |
| Continuous current | Max. 45 mA |
| Switching delay 0 -> 1 and 1 -> 0 | Max. 5 µs |
| Switching frequency (resistive load) | Max. 100 kHz |
| Protection | |
| Short circuit protection | Yes |
| Overload protection | Yes |
| Short circuit current at 24 V (until cut-off) | Approx. 0.3 A |
| Readable outputs | Yes |
| **Analog inputs** | **8AC131.60-1** |
| Number of inputs | Max. 2 |
| Design | Differential input or single ended input |
| Electrical isolation | |
| Input - ACOPOS | Yes |
| Input - Input | No |
| Input signal | |
| Rated | -10 V to +10 V |
| Maximum | -15 V to +15 V |
| Operating mode | Cyclic measurement synchronous to 50 µs ACOPOS clock |
| Digital converter resolution | 12-bit |
| Non-linearity | ±1 LSB |
| Output format | INT16 $8000 - $7FF0<br>LSB = $0010 = 4.883 mV |
| Conversion procedure | Successive approximation |
| Conversion time for both inputs | <50 µs |
| Differential input impedance | > 10 MΩ |
| Input filter | Analog low pass 3rd order / cut-off frequency: 10 kHz |
| Basic Accuracy at 25°C | Refers to the measurement range limit.<br>±0.05% [1] |
| Offset drift | Max. ±0.0005% / °C [1] |
| Gain drift | Max. ±0.006% / °C [1] |
| Cross-talk between the analog inputs | Min. -90 dB at 1kHz |
| Common-mode rejection | |
| DC | Min. -73 dB |
| 50 Hz | Min. -73 dB |
| Modulation compared to ground potential | Max. ±50 V |
| Modulation between the analog input channels | Max. ±5 V |

1) Refers to the measurement range limit.

| Operational conditions | 8AC131.60-1 |
|---|---|
| Ambient temperature during operation | --- [1] |
| Relative humidity during operation | --- [1] |

1) ACOPOS plug-in modules can be used in an ACOPOS servo drive; the corresponding values can be found in the technical data of the respective ACOPOS servo drive.

| Storage and transport conditions | 8AC131.60-1 |
|---|---|
| Storage temperature | -25 to +55°C |
| Relative humidity during storage | 5 to 95%, non-condensing |
| Transport temperature | -25 to +70°C |
| Relative humidity during transport | 95% at +40°C |

| Required accessories | | |
|---|---|---|
| 7TB712.9 | Terminal block, 12-pin, screw clamps | 1721 |
| 7TB712.91 | Terminal block, 12-pin, cage clamps | 1721 |

# CPU module
# 8AC140

8AC140.60-2

8AC140.61-2

- Complete PLC for installation in ACOPOS servo drives
- Removable application memory (CompactFlash) [1]
- Interfaces for connecting to CAN bus, Profibus or Ethernet networks [2]
- Integrated analog input and up to three digital inputs/outputs (can be configured individually as input/output)
- Can be delivered with built-in CNC function (ARNC0, only on 8AC140.61-3)

1) Application memory must be ordered separately.

2) Ethernet interface only on 8AC140.60-3 and 8AC140.61-3.

| General information | 8AC140.60-2 | 8AC140.60-3 | 8AC140.61-3 |
|---|---|---|---|
| C-UL-US listed | Yes | Yes | Yes |
| Module type | ACOPOS plug-in module double-width | ACOPOS plug-in module double-width | ACOPOS plug-in module double-width |
| Slot [1] | Slots 1 + 2 | Slots 1 + 2 | Slots 1 + 2 |
| Power consumption | Max. 4.5 W | Max. 4.5 W | Max. 4.5 W |
| Visual Components capability | Yes | Yes | Yes |
| ACOPOS capability | Yes | | Yes |

1) The AC140 is a module with double-width and occupies slots 1 and 2.

| CPU | 8AC140.60-2 | 8AC140.60-3 | 8AC140.61-3 |
|---|---|---|---|
| Processor clock | 100 MHz | 100 MHz | 100 MHz |
| SRAM | 32 kB | 32 kB | 32 kB |
| DRAM | 16 MB | 32 MB | 32 MB |
| Operating system | AC140 (version V2.67 and higher) | AC140 (version V2.67 and higher) | AC140 (version V2.67 and higher) |
| **IF1 application interface** | **8AC140.60-2** | **8AC140.60-3** | **8AC140.61-3** |
| Interface type | RS232 | RS232 | RS232 |
| Electrical isolation | No | No | No |
| Design | 9-pin DSUB plug | 9-pin DSUB plug | 9-pin DSUB plug |
| Max. distance | 15 m / 19,200 baud | 15 m / 19,200 baud | 15 m / 19,200 baud |
| Max. baud rate | 115.2 kBaud | 115.2 kBaud | 115.2 kBaud |
| Display | X1 LED | X1 LED | X1 LED |
| **IF2 application interface** | **8AC140.60-2** | **8AC140.60-3** | **8AC140.61-3** |
| Interface type | CAN bus | CAN bus | CAN bus |
| Electrical isolation | Yes | Yes | Yes |
| Design | 9-pin DSUB plug | 9-pin DSUB plug | 9-pin DSUB plug |
| Max. distance | 1000 m | 1000 m | 1000 m |
| Max. baud rate | | | |
| Bus lengths up to 60 m | 500 kBit/s | 500 kBit/s | 500 kBit/s |
| Bus lengths up to 200 m | 250 kBit/s | 250 kBit/s | 250 kBit/s |
| Bus lengths up to 1,000 m | 50 kBit/s | 50 kBit/s | 50 kBit/s |
| Indicators | RX / TX LEDs | RX / TX LEDs | RX / TX LEDs |
| Network-capable | Yes | Yes | Yes |
| Bus termination resistor | Externally wired | Externally wired | Externally wired |
| **IF3 application interface** | **8AC140.60-2** | **8AC140.60-3** | **8AC140.61-3** |
| Interface type | RS485 | RS485 | RS485 |
| Transfer protocol | Profibus DP | Profibus DP | Profibus DP |
| Electrical isolation | Yes | Yes | Yes |
| Design | 9-pin DSUB socket | 9-pin DSUB socket | 9-pin DSUB socket |
| Controller | ASIC SPC3 | ASIC SPC3 | ASIC SPC3 |
| RAM | 1.5 kByte | 1.5 kByte | 1.5 kByte |
| Max. distance | 1000 m | 1000 m | 1000 m |
| Max. baud rate | | | |
| Bus lengths up to 100 m | 12 MBit/s | 12 MBit/s | 12 MBit/s |
| Bus lengths up to 200 m | 1.5 MBit/s | 1.5 MBit/s | 1.5 MBit/s |
| Bus lengths up to 400 m | 500 kBit/s | 500 kBit/s | 500 kBit/s |
| Bus lengths up to 1,000 m | 187.5 kBit/s | 187.5 kBit/s | 187.5 kBit/s |
| Indicators | RX / TX LEDs | PB LED | PB LED |
| Network-capable | Yes | Yes | Yes |
| Bus termination resistor | External T-connector | External T-connector | External T-connector |

| Application interface IF5 | 8AC140.60-2 | 8AC140.60-3 | 8AC140.61-3 |
|---|---|---|---|
| Interface type | --- | Ethernet | Ethernet |
| Electrical isolation | --- | Yes | Yes |
| Design | --- | RJ45 socket | RJ45 socket |
| Max. distance | --- | 100 m | 100 m |
| Baud rate | --- | 10/100 MBit/s | 10/100 MBit/s |
| Display | --- | ACT LED | ACT LED |
| Network-capable | --- | Yes | Yes |
| **Inputs/outputs** | **8AC140.60-2** | **8AC140.60-3** | **8AC140.61-3** |
| Connection, module-side | 8-pin connector | 8-pin connector | 8-pin connector |
| Configuration of the digital inputs/outputs | Can be configured individually as input or output | Can be configured individually as input or output | Can be configured individually as input or output |
| **Digital inputs [1)]** | **8AC140.60-2** | **8AC140.60-3** | **8AC140.61-3** |
| Number of inputs | Max. 3 | Max. 3 | Max. 3 |
| Wiring | Sink | Sink | Sink |
| Electrical isolation | | | |
| Input - ACOPOS | Yes | Yes | Yes |
| Input - Input | No | No | No |
| Input voltage | | | |
| Rated | 24 VDC | 24 VDC | 24 VDC |
| Maximum | 30 VDC | 30 VDC | 30 VDC |
| Switching threshold | | | |
| LOW | < 5 V | < 5 V | < 5 V |
| HIGH | >15 V | >15 V | >15 V |
| Input current at rated voltage | Approx. 4.2 mA | Approx. 4.2 mA | Approx. 4.2 mA |
| Input delay | <5 µs | <5 µs | <5 µs |
| Modulation compared to ground potential | Max. ±30 V | Max. ±30 V | Max. ±30 V |

1) Shielded cables must be used for inputs 1 - 3.

| Event counter | 8AC140.60-2 | 8AC140.60-3 | 8AC140.61-3 |
|---|---|---|---|
| Signal form | Square wave pulse | Square wave pulse | Square wave pulse |
| Input frequency | Max. 100 kHz | Max. 100 kHz | Max. 100 kHz |
| Pulse length | Min. 5 µs | Min. 5 µs | Min. 5 µs |
| Counter size | 32-bit | 32-bit | 32-bit |
| Inputs | | | |
| Input 1 | Counter 1 | Counter 1 | Counter 1 |
| Input 2 | --- | --- | --- |
| Input 3 | --- | --- | --- |
| **Incremental counter** | **8AC140.60-2** | **8AC140.60-3** | **8AC140.61-3** |
| Signal form | Square wave pulse | Square wave pulse | Square wave pulse |
| Evaluation | 4x | 4x | 4x |
| Encoder monitoring | No | No | No |
| Input frequency | Max. 20 kHz | Max. 20 kHz | Max. 20 kHz |
| Counter frequency | Max. 80 kHz | Max. 80 kHz | Max. 80 kHz |
| Reference frequency | Max. 20 kHz | Max. 20 kHz | Max. 20 kHz |
| Distance between edges | Min. 5 µs | Min. 5 µs | Min. 5 µs |
| Counter size | 16-bit | 16-bit | 16-bit |
| Inputs | | | |
| Input 1 | Channel A | Channel A | Channel A |
| Input 2 | Channel B | Channel B | Channel B |
| Input 3 | Reference pulse R | Reference pulse R | Reference pulse R |

# CPU module
# 8AC140

| Gate measurement | 8AC140.60-2 | 8AC140.60-3 | 8AC140.61-3 |
|---|---|---|---|
| Signal form | Square wave pulse | Square wave pulse | Square wave pulse |
| Gate frequency | Max. 100 kHz | Max. 100 kHz | Max. 100 kHz |
| Pulse length | Min. 5 µs | Min. 5 µs | Min. 5 µs |
| Counter frequency | | | |
| Internal | 31.25 kHz or 4 MHz | 31.25 kHz or 4 MHz | 31.25 kHz or 4 MHz |
| External | Max. 100 kHz | Max. 100 kHz | Max. 100 kHz |
| **Period measurement** | **8AC140.60-2** | **8AC140.60-3** | **8AC140.61-3** |
| Signal form | Square wave pulse | Square wave pulse | Square wave pulse |
| Input frequency | Max. 100 kHz | Max. 100 kHz | Max. 100 kHz |
| Pulse length | Min. 5 µs | Min. 5 µs | Min. 5 µs |
| Counter frequency | | | |
| Internal | 31.25 kHz or 4 MHz | 31.25 kHz or 4 MHz | 31.25 kHz or 4 MHz |
| External | Max. 100 kHz | Max. 100 kHz | Max. 100 kHz |
| **Digital outputs** | **8AC140.60-2** | **8AC140.60-3** | **8AC140.61-3** |
| Number of outputs | Max. 3 | Max. 3 | Max. 3 |
| Type | High-side transistor outputs | High-side transistor outputs | High-side transistor outputs |
| Electrical isolation | | | |
| Output - ACOPOS | Yes | Yes | Yes |
| Output - Output | No | No | No |
| Switching voltage | | | |
| Minimum | 18 VDC | 18 VDC | 18 VDC |
| Rated | 24 VDC | 24 VDC | 24 VDC |
| Maximum | 30 VDC | 30 VDC | 30 VDC |
| Continuous current | Max. 500 mA | Max. 500 mA | Max. 500 mA |
| Switching delay 0 -> 1 and 1 -> 0 | Max. 500 µs (typ. 250 µs) | Max. 500 µs (typ. 250 µs) | Max. 500 µs (typ. 250 µs) |
| Switching frequency (resistive load) | Max. 100 Hz | Max. 100 Hz | Max. 100 Hz |
| Protection | | | |
| Short circuit protection | Yes | Yes | Yes |
| Overload protection | Yes | Yes | Yes |
| Continuous short circuit current at 24 V | Typ. 4 A | Typ. 4 A | Typ. 4 A |
| Readable outputs | Yes | Yes | Yes |
| **Analog input** | **8AC140.60-2** | **8AC140.60-3** | **8AC140.61-3** |
| Design | Differential input | Differential input | Differential input |
| Electrical isolation | | | |
| Input - ACOPOS [1)] | No, max. modulation: ±13 V | No, max. modulation: ±13 V | No, max. modulation: ±13 V |
| Input signal | | | |
| Rated | -10 V to +10 V | -10 V to +10 V | -10 V to +10 V |
| Maximum | -13 V to +13 V | -13 V to +13 V | -13 V to +13 V |
| Operating mode | Cyclic measurement non-synchronous to 50 µs ACOPOS clock | Cyclic measurement non-synchronous to 50 µs ACOPOS clock | Cyclic measurement non-synchronous to 50 µs ACOPOS clock |
| Digital converter resolution | 12-bit | 12-bit | 12-bit |
| Non-linearity | ±2 LSB | ±2 LSB | ±2 LSB |
| Output format | INT 16 $8001 - $7FFF<br>LSB = $0010 = 4.88 mV | INT 16 $8001 - $7FFF<br>LSB = $0010 = 4.88 mV | INT 16 $8001 - $7FFF<br>LSB = $0010 = 4.88 mV |
| Conversion procedure | Successive approximation | Successive approximation | Successive approximation |
| Conversion time | <50 µs | <50 µs | <50 µs |
| Differential input impedance | 20 MΩ | 20 MΩ | 20 MΩ |
| Input filter | Analog low pass 3rd-order<br>cut-off frequency: 10 kHz | Analog low pass 3rd-order<br>cut-off frequency: 10 kHz | Analog low pass 3rd-order<br>cut-off frequency: 10 kHz |
| Common-mode rejection | | | |
| DC | Min. 73 dB | Min. 73 dB | Min. 73 dB |
| 50 Hz | Min. 73 dB | Min. 73 dB | Min. 73 dB |

1) External electrical isolation for the connected sensors is recommended because the analog input is not electrically isolated.

| Operational conditions | 8AC140.60-2 | 8AC140.60-3 | 8AC140.61-3 |
|---|---|---|---|
| Ambient temperature during operation | --- [1] | --- [1] | --- [1] |
| Relative humidity during operation | --- [1] | --- [1] | --- [1] |

1) ACOPOS plug-in modules can be used in an ACOPOS servo drive; the corresponding values can be found in the technical data of the respective for a list of exclusive actions.

| Storage and transport conditions | 8AC140.60-2 | 8AC140.60-3 | 8AC140.61-3 |
|---|---|---|---|
| Storage temperature | -25 to +55°C | -25 to +55°C | -25 to +55°C |
| Relative humidity during storage | 5 to 95%, non-condensing | 5 to 95%, non-condensing | 5 to 95%, non-condensing |
| Transport temperature | -25 to +70°C | -25 to +70°C | -25 to +70°C |
| Relative humidity during transport | 95% at +40°C | 95% at +40°C | 95% at +40°C |

| Required accessories | | |
|---|---|---|
| 5CFCRD.0064-03 | CompactFlash 64 MB ATA/IDE SiliconSystems | 1706 |
| 5CFCRD.0128-03 | CompactFlash 128 MB ATA/IDE SiliconSystems | 1706 |
| 5CFCRD.0256-03 | CompactFlash 256 MB ATA/IDE SiliconSystems | 1706 |
| 5CFCRD.0512-03 | CompactFlash 512 MB ATA/IDE SiliconSystems | 1706 |
| 5CFCRD.1024-03 | CompactFlash 1024 MB ATA/IDE SiliconSystems | 1706 |
| 5CFCRD.2048-03 | CompactFlash 2048 MB ATA/IDE SiliconSystems | 1706 |
| 5CFCRD.4096-03 | CompactFlash 4096 MB ATA/IDE SiliconSystems | 1706 |
| 5CFCRD.8092-03 | CompactFlash 8092 MB ATA/IDE SiliconSystems | 1706 |
| 0TB708.91 | Accessory terminal block, 8-pin, cage clamps 1.5 mm² | 1716 |

| Optional accessories | | |
|---|---|---|
| 0G0001.00-090 | Cable PC <-> PLC/PW, RS232, online cable | 1708 |
| 7AC911.9 | Bus connector, CAN | 1724 |
| 0AC912.9 | Bus connector, CAN, 1 CAN interface | 1726 |
| 0AC913.92 | Bus connecter, CAN, 2 CAN interfaces, including 30 cm connection cable (DSUB connector) | 1726 |

# CPU module
# 8AC141

- Complete PLC for installation in ACOPOS servo drives
- Removable application memory (CompactFlash) [1)]
- Interfaces for connecting to CAN bus or Ethernet networks
- X2X Link interface
- Up to three digital inputs/outputs (can be configured individually as input / output)
- With built-in CNC function (ARNC0, only on 8AC141.61-3)

1) Application memory must be ordered separately.

| General information | 8AC141.60-2 | 8AC141.61-3 |
|---|---|---|
| C-UL-US listed | Yes | Yes |
| Module type | ACOPOS plug-in module double-width | ACOPOS plug-in module double-width |
| Slot [1)] | Slots 1 + 2 | Slots 1 + 2 |
| Power consumption | Max. 4.5 W | Max. 4.5 W |
| Visual Components capability | Yes | Yes |
| ACOPOS capability | Yes | Yes |

1) The AC141 is a module with double-width and occupies slots 1 and 2.

| CPU | 8AC141.60-2 | 8AC141.61-3 |
|---|---|---|
| Processor clock | 100 MHz | 100 MHz |
| SRAM | 32 kB | 32 kB |
| DRAM | 16 MB | 32 MB |
| Operating system | AC140 (version V2.80 and higher) | AC140 (version V2.80 and higher) |
| **IF1 application interface** | **8AC141.60-2** | **8AC141.61-3** |
| Interface type | RS232 | RS232 |
| Electrical isolation | No | No |
| Design | 9-pin DSUB plug | 9-pin DSUB plug |
| Max. distance | 15 m / 19,200 baud | 15 m / 19,200 baud |
| Max. baud rate | 115.2 kBaud | 115.2 kBaud |
| Display | 232 LED | 232 LED |
| **Application interfaces IF2, IF3** | **8AC141.60-2** | **8AC141.61-3** |
| Interface type | CAN bus | CAN bus |
| Electrical isolation | Yes | Yes |
| Design | 9-pin DSUB plug | 9-pin DSUB plug |
| Max. distance | 1000 m | 1000 m |
| Max. baud rate | | |
| Bus lengths up to 60 m | 500 kBit/s | 500 kBit/s |
| Bus lengths up to 200 m | 250 kBit/s | 250 kBit/s |
| Bus lengths up to 1,000 m | 50 kBit/s | 50 kBit/s |
| Indicators | | |
| IF2 | CAN1 LED | CAN1 LED |
| IF3 | CAN2 LED | CAN2 LED |
| Network-capable | Yes | Yes |
| Bus termination resistor | Externally wired | Externally wired |
| **IF4 application interface** | **8AC141.60-2** | **8AC141.61-3** |
| Interface type | X2X | X2X |
| Electrical isolation | Yes | Yes |
| Design | 4-pin connector | 4-pin connector |
| Max. distance | 100 m | 100 m |
| Indicators | X2X LED | X2X LED |
| **Application interface IF6** | **8AC141.60-2** | **8AC141.61-3** |
| Interface type | Ethernet | Ethernet |
| Electrical isolation | Yes | Yes |
| Design | RJ45 socket | RJ45 socket |
| Max. distance | 100 m | 100 m |
| Baud rate | 10/100 MBit/s | 10/100 MBit/s |
| Display | ACT LED | ACT LED |
| Network-capable | Yes | Yes |

| Inputs/outputs | 8AC141.60-2 | 8AC141.61-3 |
|---|---|---|
| Connection, module-side | 8-pin connector | 8-pin connector |
| Configuration of the digital inputs/outputs | Can be configured individually as input or output | Can be configured individually as input or output |
| **Digital inputs [1]** | **8AC141.60-2** | **8AC141.61-3** |
| Number of inputs | Max. 3 | Max. 3 |
| Wiring | Sink | Sink |
| Electrical isolation | | |
| Input - ACOPOS | Yes | Yes |
| Input - Input | No | No |
| Input voltage | | |
| Rated | 24 VDC | 24 VDC |
| Maximum | 30 VDC | 30 VDC |
| Switching threshold | | |
| LOW | < 5 V | < 5 V |
| HIGH | >15 V | >15 V |
| Input current at rated voltage | Approx. 4.2 mA | Approx. 4.2 mA |
| Input delay | <5 µs | <5 µs |
| Modulation compared to ground potential | Max. ±30 V | Max. ±30 V |

1) Shielded cables must be used for inputs 1 - 3.

| Event counter | 8AC141.60-2 | 8AC141.61-3 |
|---|---|---|
| Signal form | Square wave pulse | Square wave pulse |
| Input frequency | Max. 100 kHz | Max. 100 kHz |
| Pulse length | Min. 5 µs | Min. 5 µs |
| Counter size | 32-bit | 32-bit |
| Inputs | | |
| Input 1 | Counter 1 | Counter 1 |
| Input 2 | Count direction (only in stepper motor mode) | Count direction (only in stepper motor mode) |
| Input 3 | --- | --- |
| **Incremental counter** | **8AC141.60-2** | **8AC141.61-3** |
| Signal form | Square wave pulse | Square wave pulse |
| Evaluation | 4x | 4x |
| Encoder monitoring | No | No |
| Input frequency | Max. 20 kHz | Max. 20 kHz |
| Counter frequency | Max. 80 kHz | Max. 80 kHz |
| Reference frequency | Max. 20 kHz | Max. 20 kHz |
| Distance between edges | Min. 5 µs | Min. 5 µs |
| Counter size | 16-bit | 16-bit |
| Inputs | | |
| Input 1 | Channel A | Channel A |
| Input 2 | Channel B | Channel B |
| Input 3 | Reference pulse R | Reference pulse R |
| **Gate measurement** | **8AC141.60-2** | **8AC141.61-3** |
| Signal form | Square wave pulse | Square wave pulse |
| Gate frequency | Max. 100 kHz | Max. 100 kHz |
| Pulse length | Min. 5 µs | Min. 5 µs |
| Counter frequency | | |
| Internal | 31.25 kHz or 4 MHz | 31.25 kHz or 4 MHz |
| External | Max. 100 kHz | Max. 100 kHz |
| **Period measurement** | **8AC141.60-2** | **8AC141.61-3** |
| Signal form | Square wave pulse | Square wave pulse |
| Input frequency | Max. 100 kHz | Max. 100 kHz |
| Pulse length | Min. 5 µs | Min. 5 µs |
| Counter frequency | | |
| Internal | 31.25 kHz or 4 MHz | 31.25 kHz or 4 MHz |
| External | Max. 100 kHz | Max. 100 kHz |

# CPU module
# 8AC141

| Digital outputs | 8AC141.60-2 | 8AC141.61-3 |
|---|---|---|
| Number of outputs | Max. 3 | Max. 3 |
| Type | High-side transistor outputs | High-side transistor outputs |
| Electrical isolation | | |
| Output - ACOPOS | Yes | Yes |
| Output - Output | No | No |
| Switching voltage | | |
| Minimum | 18 VDC | 18 VDC |
| Rated | 24 VDC | 24 VDC |
| Maximum | 30 VDC | 30 VDC |
| Continuous current | Max. 500 mA | Max. 500 mA |
| Switching delay 0 -> 1 and 1 -> 0 | Max. 500 µs (typ. 250 µs) | Max. 500 µs (typ. 250 µs) |
| Switching frequency (resistive load) | Max. 100 Hz | Max. 100 Hz |
| Protection | | |
| Short circuit protection | Yes | Yes |
| Overload protection | Yes | Yes |
| Continuous short circuit current at 24 V | Typ. 4 A | Typ. 4 A |
| Readable outputs | Yes | Yes |

| Analog input | 8AC141.60-2 | 8AC141.61-3 |
|---|---|---|
| Design | Differential input | Differential input |
| Electrical isolation | | |
| Input - ACOPOS [1] | No, max. modulation: ±13 V | No, max. modulation: ±13 V |
| Input signal | | |
| Rated | -10 V to +10 V | -10 V to +10 V |
| Maximum | -13 V to +13 V | -13 V to +13 V |
| Operating mode | Cyclic measurement, non-synchronous to 50 µs ACOPOS clock | Cyclic measurement, non-synchronous to 50 µs ACOPOS clock |
| Digital converter resolution | 12-bit | 12-bit |
| Non-linearity | ±2 LSB | ±2 LSB |
| Output format | INT 16 $8001 - $7FFF<br>LSB = $0010 = 4.88 mV | INT 16 $8001 - $7FFF<br>LSB = $0010 = 4.88 mV |
| Conversion procedure | Successive approximation | Successive approximation |
| Conversion time | <50 µs | <50 µs |
| Differential input impedance | 20 MΩ | 20 MΩ |
| Input filter | Analog low pass 3rd-order<br>cut-off frequency: 10 kHz | Analog low pass 3rd-order<br>cut-off frequency: 10 kHz |
| Common-mode rejection | | |
| DC | Min. 73 dB | Min. 73 dB |
| 50 Hz | Min. 73 dB | Min. 73 dB |

1) External electrical isolation for the connected sensors is recommended because the analog input is not electrically isolated.

| Operational conditions | 8AC141.60-2 | 8AC141.61-3 |
|---|---|---|
| Ambient temperature during operation | --- [1] | --- [1] |
| Relative humidity during operation | --- [1] | --- [1] |

1) ACOPOS plug-in modules can be used in an ACOPOS servo drive; the corresponding values can be found in the technical data of the respective for a list of exclusive actions.

| Storage and transport conditions | 8AC141.60-2 | 8AC141.61-3 |
|---|---|---|
| Storage temperature | -25 to +55°C | -25 to +55°C |
| Relative humidity during storage | 5 to 95%, non-condensing | 5 to 95%, non-condensing |
| Transport temperature | -25 to +70°C | -25 to +70°C |
| Relative humidity during transport | 95% at +40°C | 95% at +40°C |

| Required accessories | | |
|---|---|---|
| 5CFCRD.0064-03 | CompactFlash 64 MB ATA/IDE SiliconSystems | 1706 |
| 5CFCRD.0128-03 | CompactFlash 128 MB ATA/IDE SiliconSystems | 1706 |
| 5CFCRD.0256-03 | CompactFlash 256 MB ATA/IDE SiliconSystems | 1706 |
| 5CFCRD.0512-03 | CompactFlash 512 MB ATA/IDE SiliconSystems | 1706 |
| 5CFCRD.1024-03 | CompactFlash 1024 MB ATA/IDE SiliconSystems | 1706 |
| 5CFCRD.2048-03 | CompactFlash 2048 MB ATA/IDE SiliconSystems | 1706 |
| 5CFCRD.4096-03 | CompactFlash 4096 MB ATA/IDE SiliconSystems | 1706 |
| 5CFCRD.8092-03 | CompactFlash 8092 MB ATA/IDE SiliconSystems | 1706 |
| 0TB708.91 | Accessory terminal block, 8-pin, cage clamps 1.5 mm² | 1716 |
| 0TB704.9 | Accessory terminal block, 4-pin, screw clamp 1.5 mm² | 1714 |
| 0TB704.91 | Accessory terminal block, 4-pin, cage clamps 2.5 mm² | 1714 |

| Optional accessories | | |
|---|---|---|
| 0G0001.00-090 | Cable PC <-> PLC/PW, RS232, online cable | 1708 |
| 7AC911.9 | Bus connector, CAN | 1724 |
| 0AC912.9 | Bus connector, CAN, 1 CAN interface | 1726 |
| 0AC913.92 | Bus connecter, CAN, 2 CAN interfaces, including 30 cm connection cable | 1726 |

# Motor cables 1.5 mm²
# 8CM

- UL/CSA listed
- Can be used in cable drag chains
- Optimally produced for use with ACOPOS servo drives 1010/1016/1022/1045/1090 and B&R servo motors with size 1 motor plugs

Available from production in six different lengths: [1)]

| Cable length | Model number |
|---|---|
| 5 m | 8CM005.12-1 |
| 7 m | 8CM007.12-1 |
| 10 m | 8CM010.12-1 |
| 15 m | 8CM015.12-1 |
| 20 m | 8CM020.12-1 |
| 25 m | 8CM025.12-1 |

1) Custom fabrications are available upon request.

| General information | 8CMxxx.12-1 |
|---|---|
| Cable cross section | 4 x 1.5 mm² + 2 x 2 x 0.75 mm² |
| Durability | Oil resistant according to VDE 0472 part 803, as well as standard hydraulic oil |
| Certification | UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064 |
| **Lines** | **8CMxxx.12-1** |
| Power lines | 1.5 mm², tinned Cu wire |
| Wire insulation | Special thermoplastic material |
| Wire colors | Black, brown, blue, yellow/green |
| Signal lines | 0.75 mm², tinned Cu wire |
| Wire insulation | Special thermoplastic material |
| Wire colors | White, white/red, white/blue, white/green |
| **Cable structure** | **8CMxxx.12-1** |
| Power lines | |
| Stranding | No |
| Shield | No |
| Signal lines | |
| Stranding | White with white/red and white/blue with white/green |
| Shield | Separate shielding for pairs, tinned Cu mesh, optical coverage 85% > and foil banding |
| Cable stranding | With filler elements and foil banding |
| Cable shielding | Tinned Cu mesh, optical coverage 85% and wrapped in isolating fabric |
| Outer sheathing | |
| Material | PUR |
| Color | Orange, similar to RAL 2003 flat |
| Labeling | BERNECKER & RAINER 4x1.5+2x2x0.75 FLEX |
| **Electrical characteristics** | **8CMxxx.12-1** |
| Conductor resistance | |
| Power lines | ≤ 14 Ω/km |
| Signal lines | ≤ 19 Ω/km |
| Insulation resistance | > 200 Ω/km |
| Test voltage | |
| Wire/wire | 3 kV |
| Wire/shield | 3 kV |
| Operating voltage | Max. 1000 V |
| **Mechanical characteristics** | **8CMxxx.12-1** |
| Temperature range | |
| Moving | -10°C to +70°C |
| Static | -20°C to +90°C |
| Outer diameter | 12.8 mm ± 0.4 mm |
| Flex radius | >96 mm |
| Speed | ≤ 4 m/s |
| Acceleration | < 60 m/s² |
| Flex cycles | ≥ 3,000,000 |
| Weight | 0.26 kg/m |

# Motor cables 4 mm²
# 8CM

- UL/CSA certified
- Can be used in cable drag chains
- Produced for optimal use with ACOPOS servo drives 1180/1320 and B&R servo motors with size 1 motor plugs

Available from production in six different lengths: [1)]

| Cable length | Model number |
|---|---|
| 5 m | 8CM005.12-3 |
| 7 m | 8CM007.12-3 |
| 10 m | 8CM010.12-3 |
| 15 m | 8CM015.12-3 |
| 20 m | 8CM020.12-3 |
| 25 m | 8CM025.12-3 |

1) Custom fabrications are available upon request.

| General information | 8CMxxx.12-3 |
|---|---|
| Cable cross section | 4 x 4 mm² + 2 x 2 x 1 mm² |
| Durability | Oil resistant according to VDE 0472 part 803, as well as standard hydraulic oil |
| Certification | UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064 |
| **Lines** | **8CMxxx.12-3** |
| Power lines | 4 mm², tinned Cu wire |
| Wire insulation | Special thermoplastic material |
| Wire colors | Black, brown, blue, yellow/green |
| Signal lines | 1 mm², tinned Cu wire |
| Wire insulation | Special thermoplastic material |
| Wire colors | White, white/red, white/blue, white/green |
| **Cable structure** | **8CMxxx.12-3** |
| Power lines | |
| Stranding | No |
| Shield | No |
| Signal lines | |
| Stranding | White with white/red and white/blue with white/green |
| Shield | Separate shielding for pairs, tinned Cu mesh, optical coverage 85% > and foil banding |
| Cable stranding | With filler elements and foil banding |
| Cable shielding | Tinned Cu mesh, optical coverage 85% and wrapped in isolating fabric |
| Outer sheathing | |
| Material | PUR |
| Color | Orange, similar to RAL 2003 flat |
| Labeling | BERNECKER & RAINER 4x4.0+2x2x1.0 FLEX |
| **Electrical characteristics** | **8CMxxx.12-3** |
| Conductor resistance | |
| Power lines | ≤ 5.2 Ω/km |
| Signal lines | ≤ 19 Ω/km |
| Insulation resistance | > 200 MΩ/km |
| Test voltage | |
| Wire/wire | 3 kV |
| Wire/shield | 3 kV |
| Operating voltage | Max. 1000 V |
| **Mechanical characteristics** | **8CMxxx.12-3** |
| Temperature range | |
| Moving | -10°C to +70°C |
| Static | -20°C to +90°C |
| Outer diameter | 15.8 mm ± 0.5 mm |
| Flex radius | >118.5 mm |
| Speed | ≤ 4 m/s |
| Acceleration | < 60 m/s² |
| Flex cycles | ≥ 3,000,000 |
| Weight | 0.45 kg/m |

# Motor cables 10 mm²
# 8CM

- UL/CSA certified
- Can be used in cable drag chains
- Optimally produced for use with ACOPOS servo drives 1640/128M and B&R servo motors with size 1.5 motor plugs

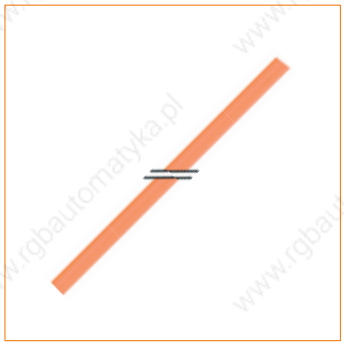
Available from production in six different lengths: [1]

| Cable length | Model number |
|---|---|
| 5 m | 8CM005.12-5 |
| 7 m | 8CM007.12-5 |
| 10 m | 8CM010.12-5 |
| 15 m | 8CM015.12-5 |
| 20 m | 8CM020.12-5 |
| 25 m | 8CM025.12-5 |

1) Custom fabrications are available upon request.

| General information | 8CMxxx.12-5 |
|---|---|
| Cable cross section | 4 x 10 mm² + 2 x 2 x 1.5 mm² |
| Durability | Oil resistant according to VDE 0472 part 803, as well as standard hydraulic oil |
| Certification | UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064 |
| **Lines** | **8CMxxx.12-5** |
| Power lines | 10 mm², tinned Cu wire |
| Wire insulation | Special thermoplastic material |
| Wire colors | Black, brown, blue, yellow/green |
| Signal lines | 1.5 mm², tinned Cu wire |
| Wire insulation | Special thermoplastic material |
| Wire colors | White, white/red, white/blue, white/green |
| **Cable structure** | **8CMxxx.12-5** |
| Power lines | |
| Stranding | No |
| Shield | No |
| Signal lines | |
| Stranding | White with white/red and white/blue with white/green |
| Shield | Separate shielding for pairs, tinned Cu mesh, optical coverage 85% > and foil banding |
| Cable stranding | With filler elements and foil banding |
| Cable shielding | Tinned Cu mesh, optical coverage 85% and wrapped in isolating fabric |
| Outer sheathing | |
| Material | PUR |
| Color | Orange, similar to RAL 2003 flat |
| Labeling | BERNECKER & RAINER 4x10.0+2x2x1.5 FLEX |
| **Electrical characteristics** | **8CMxxx.12-5** |
| Conductor resistance | |
| Power lines | ≤ 2.1 Ω/km |
| Signal lines | ≤ 14 Ω/km |
| Insulation resistance | > 200 MΩ/km |
| Test voltage | |
| Wire/wire | 3 kV |
| Wire/shield | 3 kV |
| Operating voltage | Max. 1000 V |
| **Mechanical characteristics** | **8CMxxx.12-5** |
| Temperature range | |
| Moving | -10°C to +70°C |
| Static | -20°C to +90°C |
| Outer diameter | 20.1 mm ± 0.7 mm |
| Flex radius | >150.8 mm |
| Speed | ≤ 4 m/s |
| Acceleration | < 60 m/s² |
| Flex cycles | ≥ 3,000,000 |
| Weight | 0.77 kg/m |

# Motor cables 35 mm²
# 8CM



- UL/CSA certified
- Can be used in cable drag chains

Available from production in six different lengths: [1)]

| Cable length | Model number |
|---|---|
| 5 m | 8CM005.12-8 |
| 7 m | 8CM007.12-8 |
| 10 m | 8CM010.12-8 |
| 15 m | 8CM015.12-8 |
| 20 m | 8CM020.12-8 |
| 25 m | 8CM025.12-8 |

1) Custom fabrications are available upon request.

| General information | 8CMxxx.12-8 |
|---|---|
| Cable cross section | 4 x 35 mm² + 2 x 2 x 1.5 mm² |
| Durability | Oil resistant according to VDE 0472 part 803, as well as standard hydraulic oil |
| Certification | UL AWM Style 20669, 90°C, 600 V, E63216 and CSA AWM I/II A/B, 90°C, 600 V, FT1 LL46064 |
| **Lines** | **8CMxxx.12-8** |
| Power lines | 35 mm², tinned Cu wire |
| Wire insulation | Special thermoplastic material |
| Wire colors | Black, brown, blue, yellow/green |
| Signal lines | 1.5 mm², tinned Cu wire |
| Wire insulation | Special thermoplastic material |
| Wire colors | White, white/red, white/blue, white/green |
| **Cable structure** | **8CMxxx.12-8** |
| Power lines | |
| Stranding | No |
| Shield | No |
| Signal lines | |
| Stranding | White with white/red and white/blue with white/green |
| Shield | Separate shielding for pairs, tinned Cu mesh, optical coverage 85% > and foil banding |
| Cable stranding | With filler elements and foil banding |
| Cable shielding | Tinned Cu mesh, optical coverage 85% and wrapped in isolating fabric |
| Outer sheathing | |
| Material | PUR |
| Color | Orange, similar to RAL 2003 flat |
| Labeling | BERNECKER & RAINER 4x35.0+2x2x1.5 FLEX |
| **Electrical characteristics** | **8CMxxx.12-8** |
| Conductor resistance | |
| Power lines | ≤ 0.6 Ω/km |
| Signal lines | ≤ 14 Ω/km |
| Insulation resistance | > 200 MΩ/km |
| Test voltage | |
| Wire/wire | 3 kV |
| Wire/shield | 1 kV |
| Operating voltage | Max. 600 V |
| **Mechanical characteristics** | **8CMxxx.12-8** |
| Temperature range | |
| Moving | -10°C to +70°C |
| Static | -20°C to +90°C |
| Outer diameter | 32.5 mm ± 1 mm |
| Flex radius | >243.8 mm |
| Speed | ≤ 4 m/s |
| Acceleration | < 60 m/s² |
| Flex cycles | ≥ 3,000,000 |
| Weight | 2.2 kg/m |

# EnDat cables
# 8CE

- UL/CSA certified
- Can be used in cable drag chains
- Produced for optimal use with ACOPOS servo drives and B&R servo motors

Available from production in six different lengths: [1)]

| Cable length | Model number |
|---|---|
| 5 m | 8CE005.12-1 |
| 7 m | 8CE007.12-1 |
| 10 m | 8CE010.12-1 |
| 15 m | 8CE015.12-1 |
| 20 m | 8CE020.12-1 |
| 25 m | 8CE025.12-1 |

1) Custom fabrications are available upon request.

| **General information** | **8CExxx.12-1** |
|---|---|
| Cable cross section | 10 x 0.14 mm² + 2 x 0.50 mm² |
| Durability | Oil resistant according to VDE 0472 part 803, as well as standard hydraulic oil |
| Certification | UL AWM Style 20963, 80°C, 30 V, E63216 and CSA AWM I/II A/B, 90°C, 30 V, FT1 LL46064 |
| **Lines** | **8CExxx.12-1** |
| Signal lines | 0.14 mm², tinned Cu wire |
| Wire insulation | Special thermoplastic material |
| Wire colors | Blue, brown, yellow, gray, green, pink, red, black, violet, white |
| Supply lines | 0.5 mm², tinned Cu wire |
| Wire insulation | Special thermoplastic material |
| Wire colors | White/green, white/red |
| **Cable structure** | **8CExxx.12-1** |
| Signal lines | |
| Stranding | Green with brown, gray with yellow, white with violet, black with red, pink with blue |
| Shield | No |
| Supply lines | |
| Stranding | White/red with white/green and filler elements |
| Shield | No |
| Cable stranding | With foil banding |
| Cable shielding | Cu mesh, optical coverage 85% and wrapped in isolating fabric |
| Outer sheathing | |
| Material | PUR |
| Color | RAL 6018 |
| Labeling | BERNECKER & RAINER 10x0.14+2x0.50 FLEX |
| **Electrical characteristics** | **8CExxx.12-1** |
| Conductor resistance | |
| Signal lines | ≤ 140 Ω/km |
| Supply lines | ≤ 40 Ω/km |
| Insulation resistance | > 200 MΩ/km |
| Test voltage | |
| Wire/wire | 1.5 kV |
| Wire/shield | 0.8 kV |
| Operating voltage | Max. 30 V |
| **Mechanical characteristics** | **8CExxx.12-1** |
| Temperature range | |
| Moving | -10°C to +70°C |
| Static | -20°C to +90°C |
| Outer diameter | 7.3 mm ± 0.25 mm |
| Flex radius | >55 mm |
| Speed | ≤ 4 m/s |
| Acceleration | < 60 m/s² |
| Flex cycles | ≥ 3,000,000 |
| Weight | 0.08 kg/m |

# Resolver cables
# 8CR

- UL/CSA certified
- Can be used in cable drag chains
- Optimally produced for use with ACOPOS servo drives and B&R servo motors

Available from production in six different lengths: [1]

| Cable length | Model number |
|---|---|
| 5 m | 8CR005.12-1 |
| 7 m | 8CR007.12-1 |
| 10 m | 8CR010.12-1 |
| 15 m | 8CR015.12-1 |
| 20 m | 8CR020.12-1 |
| 25 m | 8CR025.12-1 |

1) Custom fabrications are available upon request.

| General information | 8CRxxx.12-1 |
|---|---|
| Cable cross section | 3 x 2 x 24 AWG/19 |
| Durability | Oil resistant according to VDE 0472 part 803, as well as standard hydraulic oil |
| Certification | UL AWM Style 20671, 90°C, 30 V, E63216 and CSA AWM, 90°C, 30 V, I/II A/B FT1 LL46064 |
| **Lines** | **8CRxxx.12-1** |
| Signal lines | 24 AWG/19, tinned Cu wire |
| Wire insulation | Special thermoplastic material |
| Wire colors | White, brown, green, yellow, gray, pink |
| **Cable structure** | **8CRxxx.12-1** |
| Signal lines | |
| Stranding | White with brown, green with yellow, gray with pink |
| Shield | No |
| Cable stranding | The 3 pairs together covered by foil banding |
| Cable shielding | Cu mesh, optical coverage ≥ 90% and wrapped in isolating fabric |
| Outer sheathing | |
| Material | PUR |
| Color | RAL 6018 |
| Labeling | BERNECKER & RAINER 3x2x24 AWG FLEX |
| **Electrical characteristics** | **8CRxxx.12-1** |
| Conductor resistance 24 AWG | ≤ 86 Ω/km |
| Insulation resistance | > 200 MΩ/km |
| Test voltage | |
| Wire/wire | 1.5 kV |
| Wire/shield | 0.8 kV |
| Operating voltage | Max. 30 V |
| **Mechanical characteristics** | **8CRxxx.12-1** |
| Temperature range | |
| Moving | -10°C to +80°C |
| Static | -40°C to +90°C |
| Outer diameter | 6.5 mm ± 0.2 mm |
| Flex radius | ≥ 50 mm |
| Speed | ≤ 4 m/s |
| Acceleration | < 60 m/s² |
| Flex cycles | ≥ 3,000,000 |
| Weight | 0.07 kg/m |